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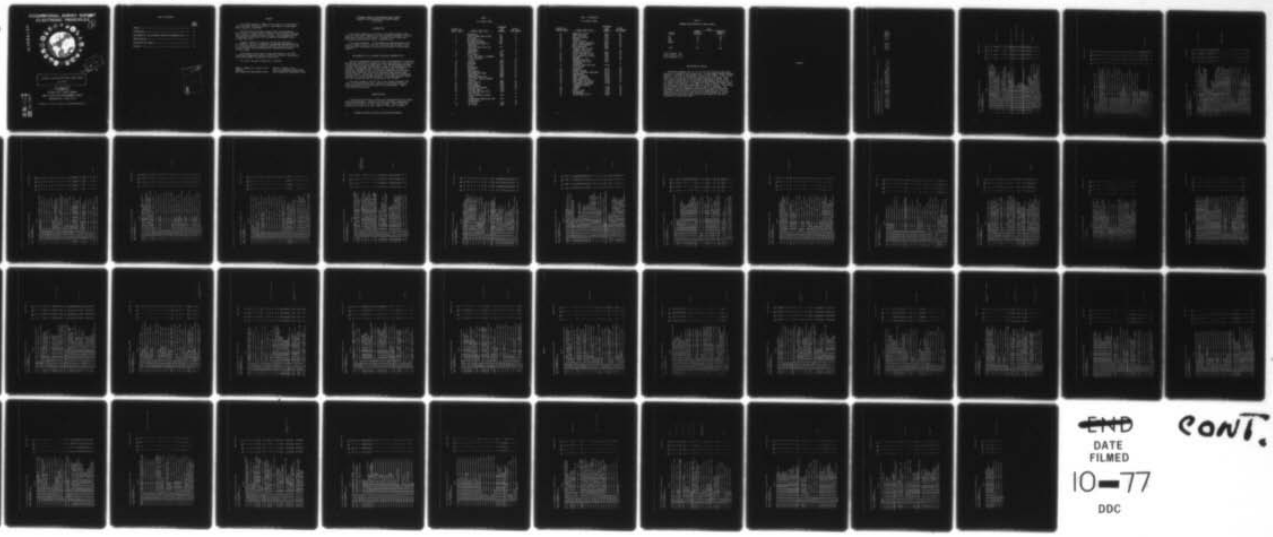

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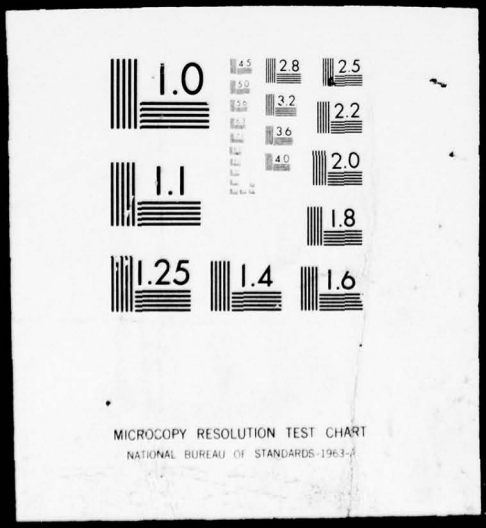

OCCUPATIONAL SURVEY REPORT
ELECTRONIC PRINCIPLES

(2)

AUTOMATIC TRACKING RADAR REPAIR CAREER LADDER

AFSC 303X3

AFPT-90-303-222
26 AUGUST 1977

OCCUPATIONAL SURVEY BRANCH
USAF OCCUPATIONAL MEASUREMENT CENTER
LACKLAND AFB TEXAS 73236

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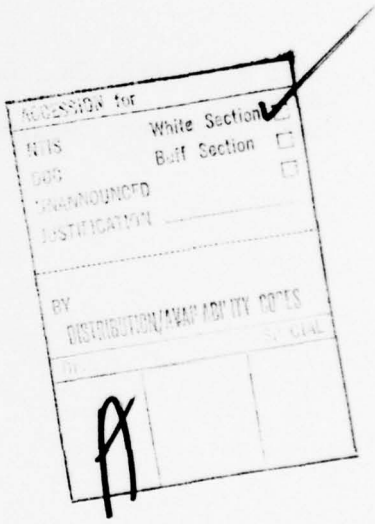

PREFACE

This report presents a summary of the results of a detailed Air Force Electronic Principles Survey of the Automatic Tracking Radar Repair Specialty, AFSC 303X3.

The Electronic Principles Inventory (EPI) was developed by Major Thomas J. O'Connor and Mr. Hendrick W. Ruck and the survey data were analyzed by Captain Charles D. Gorman. All are members of the Occupational Survey Branch, USAF Occupational Measurement Center, Lackland AFB, Texas.

Computer programs for analyzing the data were designed by Dr. Raymond E. Christal, Occupational and Manpower Research Division, Air Force Human Resources Laboratory (AFHRL), and were written by the Project Analysis and Programming Branch, Computational Sciences Division, AFHRL.

Distribution of this report is made upon request to the USAF Occupational Measurement Center, attention of the Chief, Occupational Survey Branch (OMY), Lackland AFB, Texas 78236.

This report has been reviewed and is approved.

JAMES A. TURNER, JR., Colonel, USAF
Commander
USAF Occupational Measurement Center

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USAF Occupational Measurement Center

ELECTRONIC PRINCIPLES OCCUPATIONAL SURVEY REPORT
AUTOMATIC TRACKING RADAR REPAIR CAREER LADDER
AFSC 303X3

INTRODUCTION

This report summarizes the results of the administration of the Electronic Principles Inventory to airmen assigned to Automatic Tracking Radar Repair Specialty (AFSC 303X3). The data for this report were collected during the period January through May 1977.

This report describes: (1) development and administration of the survey instrument; and (2) electronic principles used by DAFSC 5-skill level personnel both CONUS and overseas and assigned to selected major commands.

DEVELOPMENT OF THE ELECTRONIC PRINCIPLES INVENTORY (EPI)

The EPI was developed by personnel from the Occupational Survey Branch who were well qualified in theoretical physics and electronics, as well as in task analysis and survey development. Over 300 maintenance personnel from SAC, TAC, ADC, MAC, and AFCS participated in the development of the inventory. Representing the five ATC training centers, electronics experts who averaged 12 years of maintenance experience and four years of electronic principles instruction experience spent several weeks refining the EPI. In addition, personnel at the Electrical Engineering Department of the USAF Academy and the Air Force Human Resources Laboratory were consulted during the development of the inventory.

The final version of the EPI used in this survey contained 1,257 items in 62 subject matter areas covering all electronic principles training given at the five ATC technical training centers. Table 1 lists the 62 subject areas.

ADMINISTRATION

The Electronic Principles Inventory was administered by mail to AFSC 30350 airmen worldwide. Responses from 621 individuals represented 75 percent of the total of all AFSC 30353 personnel. Table 2 shows the percentage distribution by major command of the survey incumbents.

TABLE 1

EPI SUBJECT AREAS

SEQUENCE OF SUBJECT AREAS	SUBJECT AREA TITLE	BEGINNING ITEM NUMBER	GPSUM PAGE NUMBER
1	MATHEMATICS	A1	2
2	DIRECT CURRENT AND VOLTAGE	A15	2
3	RESISTANCE	A24	2
4	MULTIMETER USES	B52	3
5	ALTERNATING CURRENT	B61	4
6	INDUCTORS AND INDUCTIVE REACTANCE	B67	4
7	CAPACITORS AND CAPACITIVE REACTANCE	C92	5
8	TRANSFORMERS	C128	6
9	MAGNETISM	C171	7
10	RCL CIRCUITS	D185	8
11	SERIES AND PARALLEL RESONANCE (TIME CONSTANTS)	D229	10
12	FILTERS	D239	10
13	COUPLING	E261	11
14	SOLDERING	E273	11
15	RELAYS	E295	12
16	MICROPHONES	F314	12
17	SPEAKERS	F327	13
18	OSCILLOSCOPES	F342	13
19	SEMICONDUCTOR DIODES	G354	13
20	TRANSISTORS	G404	15
21	TRANSISTOR AMPLIFIERS	G428	16
22	SOLID-STATE SPECIAL PURPOSE DEVICES	H477	19
23	POWER SUPPLIES	H483	19
24	OSCILLATORS	H512	19
25	MULTIVIBRATORS	I539	20
26	LIMITERS AND CLAMPERS	I555	21
27	ELECTRON TUBES	I565	21
28	ELECTRON TUBE AMPLIFIERS AND CIRCUITS	J609	22
29	SPECIAL PURPOSE ELECTRON TUBES	J616	23
30	HETERODYNING, MODULATION, AND DEMODULATION	J632	23
31	AM SYSTEMS	K638	23
32	FM SYSTEMS	K666	24

TABLE 1 (CONTINUED)

EPI SUBJECT AREAS

SEQUENCE OF SUBJECT AREAS	SUBJECT AREA TITLE	BEGINNING ITEM NUMBER-	GPSUM PAGE NUMBER
33	NUMBERING SYSTEMS	K685	25
34	LOGIC FUNCTIONS	L695	25
35	BOOLEAN EQUATIONS	L708	26
36	COUNTERS	L733	27
37	TIMING CIRCUITS	M757	27
38	USE OF SIGNAL GENERATORS	M769	28
39	MOTORS AND GENERATORS	M779	28
40	METER MOVEMENTS	N808	29
41	SATURABLE REACTORS AND MAGNETIC AMPLIFIERS	N818	29
42	WAVESHAPING CIRCUITS	N834	30
43	SINGLE SIDEBAND SYSTEMS	0845	30
44	PULSE MODULATION SYSTEMS	0875	31
45	ANTENNAS	0914	32
46	TRANSMISSION LINES	P953	34
47	WAVEGUIDES AND CAVITY RESONATORS	P984	35
48	MICROWAVE AMPLIFIERS AND OSCILLATORS	P1034	37
49	REGISTERS	Q1110	39
50	STORAGE DEVICES	Q1117	40
51	DIGITAL TO ANALOG CONVERTERS	Q1126	40
52	PHANTASTRONS	Q1140	41
53	SCHMITT TRIGGERS	R1141	41
54	CABLE FABRICATION	R1144	41
55	INPUT/OUTPUT DEVICES	S1146	41
56	PHOTO SENSITIVE DEVICES	S1149	41
57	SYNCHRONOUS VIBRATIONS (CHOPPER CIRCUITS)	S1150	41
58	INFRARED	T1159	41
59	LASERS	T1186	42
60	DISPLAY TUBES	T1220	43
61	PROGRAMMING	U1234	43
62	DB AND POWER RATIOS	U1255	44

TABLE 2

COMMAND REPRESENTATION OF SURVEY SAMPLE

	30353	
COMMAND	PERCENT ASSIGNED	PERCENT OF SAMPLE
SAC	59	60
TAC	30	26
AFCS	1	1
OTHERS	10	13
TOTAL	100	100

Total Assigned - 831
Total Sampled - 621
Percent Sampled - 75%

PRESENTATON OF RESULTS

Personnel responded "yes" or "no" to the 1,257 electronic principles questions as related to their present job. A Group Summary (GPSUM) computer printout is provided in the Appendix portion of this report. Page 1 of the GPSUM lists the four selected groups identified for this report. Pages 2-44 show the percentage of the incumbents responding to the EPI items. The computer program results display the percent members answering "yes" to the subject area questions. The reader can locate a specific subject area by referring to the Appendix page number as listed in Table 1. For example, the Transformers area results are given on page 6 of the GPSUM. The percentage of survey respondents indicating use of specific electronic principles ranged from high in areas such as Capacitors (pp. 5-6) and Soldering (p. 12) to low in areas such as Infrared Systems (pp. 41-42). Additional AFSC 303X3 data can be obtained upon request to the Chief, Occupational Survey Branch (OMY).

APPENDIX

TABULATION OF ELECTRONIC PRINCIPLES UTILIZATION DATA FOR SELECTED GROUPS
IN THE 303X3 CAREER FIELD.

REPORTS ON THE FOLLOWING GROUPS WERE REQUESTED

GROUP IDENTITY = SPL001	ALL AIRMEN DAFSC 30353	CONTAINING	621 MEMBERS.
GROUP IDENTITY = SPL004	ALL AIRMEN DAFSC 30353 ASSIGNED TO SAC	CONTAINING	370 MEMBERS.
GROUP IDENTITY = SPL005	ALL AMN DAFSC 30353 ASSIGNED TO TAC	CONTAINING	161 MEMBERS.
GROUP IDENTITY = SPL006	ALL AMN DAFSC 30353 ASSIGNED TO AFCS	CONTAINING	5 MEMBERS.

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
A	1	A1-01 IN YOUR PRESENT JOB, DO YOU USE INSTRUMENTS, SUCH AS METERS OR OSCILLOSCOPES, IN WHICH IT IS NECESSARY TO	75	71	78	100	
A	2	A1-02 DO YOU USE PUBLICATIONS, SUCH AS A TECHNICAL ORDERS OR MAINTENANCE MANUALS, IN WHICH IT IS NECESSARY FOR YOU	39	39	39	80	
A	3	A1-03 DO YOU REARRANGE AND SOLVE FORMULAS OR EQUATIONS.	37	34	35	80	
A	4	A1-04 DO YOU CALCULATE THE SQUARE ROOT OF A QUANTITY.	15	16	9	60	
A	5	A1-05 DO YOU SOLVE FOR UNKNOWN QUANTITIES.	28	27	22	40	MATHEMATICS
A	6	A1-06 DO YOU CONVERT NUMBERS TO LOGARITHMS.	7	4	5	20	
A	7	A1-07 DO YOU USE LOGARITHM TABLES IN ANY TYPE OF CALCULATIONS.	9	6	7	20	
A	8	A1-08 DO YOU SOLVE QUADRATIC EQUATIONS.	6	6	4	0	
A	9	A1-09 DO YOU USE THE NATURAL SYSTEM OF LOGARITHMS.	3	2	3	0	
A	10	A1-10 DO YOU PERFORM CALCULATIONS ON VECTOR QUANTITIES.	18	18	13	40	
A	11	A1-11 DO YOU WORK WITH TRIGONOMETRIC FUNCTIONS SUCH AS SINE, COSINE, OR TANGENT.	34	36	26	80	
A	12	A1-12 DO YOU DETERMINE AREAS OF PLANE FIGURES.	8	8	7	20	
A	13	A1-13 DO YOU SOLVE OR USE SIMULTANEOUS EQUATIONS.	6	6	2	40	
A	14	A1-14 DO YOU SOLVE OR USE PROPORTIONS.	16	14	14	20	
A	15	A2-01 DO YOU USE THE TERM VOLTAGE OR VOLT (V).	84	78	91	100	
A	16	A2-02 DO YOU USE THE TERM ELECTROMOTIVE FORCE (EMF).	30	27	28	60	
A	17	A2-03 DO YOU USE THE TERM OHM.	80	75	85	100	
A	18	A2-04 DO YOU USE THE TERM ION.	15	15	11	60	
A	19	A2-05 DO YOU USE THE TERM DYNE.	9	9	7	20	DIRECT CURRENT AND VOLTAGE
A	20	A2-06 DO YOU USE THE TERM AMPERE.	79	73	84	100	
A	21	A2-07 DO YOU USE THE TERM NEUTRON.	13	13	11	60	
A	22	A2-08 DO YOU USE THE TERM COULOMB.	20	20	17	40	
A	23	A2-09 DO YOU USE THE TERM PROTON.	13	13	11	60	
A	24	A3-01 DO YOU WORK WITH RESISTORS IN YOUR PRESENT JOB.	66	61	72	80	
A	25	A3-02 DO YOU INSPECT RESISTORS.	74	68	80	100	
A	26	A3-03 DO YOU CLEAN RESISTORS.	66	63	71	100	
A	27	A3-04 DO YOU ADJUST RESISTORS.	74	70	80	100	
A	28	A3-05 DO YOU CHECK OHMIC VALUE OR RESISTORS.	73	68	80	100	
A	29	A3-06 DO YOU REMOVE OR REPLACE RESISTORS.	72	68	80	100	
A	30	A3-07 DO YOU USE OR REFER TO TEMPERATURE COEFFICIENTS FOR RESISTORS ON ANY TASKS YOU PERFORM.	21	20	18	20	RESISTANCE
A	31	A3-08 DO YOU USE OR REFER TO RESISTOR SYMBOLS SUCH AS FIXED RESISTOR SYMBOLS OR TAPPED RESISTOR SYMBOLS.	71	67	76	80	
A	32	A3-09 DO YOU IDENTIFY OR CLASSIFY THE RESISTORS YOU WORK WITH AS CARBON, FIXED WIRE, SLIDE TAP, RHEOSTAT, OR	69	64	74	100	
A	33	A3-10 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE OHMIC VALUE OF RESISTANCE.	72	66	78	100	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
A	34	A3-11 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE TOLERANCE.	67	64	68	100	
A	35	A3-12 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE FAILURE RATE.	26	25	24	40	
A	36	A3-13 DO YOU MAKE DECISIONS IN WHICH YOU MUST DETERMINE HOW TWO OR MORE BATTERIES MUST BE CONNECTED TOGETHER TO	17	16	19	20	
A	37	A3-14 DO YOU USE OR REFER TO THE SCHEMATIC SYMBOLS WHICH REPRESENT BATTERIES, FUSES, CONDUCTORS, LAMPS, OR SWITCHES	75	69	83	100	
A	38	A3-15 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES RESISTIVE CIRCUITS.	48	46	47	80	
A	39	A3-16 DO YOU CALCULATE TOTAL CURRENT FOR SERIES RESISTIVE CIRCUITS.	42	41	41	80	
A	40	A3-17 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES RESISTIVE CIRCUITS.	45	43	43	60	
A	41	A3-18 DO YOU CALCULATE POWER DISSIPATION FOR SERIES RESISTIVE CIRCUITS.	31	28	31	60	
A	42	A3-19 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES PARALLEL RESISTIVE CIRCUITS.	45	44	43	80	
A	43	A3-20 DO YOU CALCULATE TOTAL CURRENT FOR SERIES PARALLEL RESISTIVE CIRCUITS.	40	39	39	80	
A	44	A3-21 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	42	40	41	60	
A	45	A3-22 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	37	35	35	80	
A	46	A3-23 DO YOU CALCULATE POWER DISSIPATION FOR SERIES PARALLEL RESISTIVE CIRCUITS.	30	27	30	40	
A	47	A3-24 DO YOU CALCULATE TOTAL RESISTANCE FOR PARALLEL RESISTIVE CIRCUITS.	45	42	44	80	
A	48	A3-25 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RESISTIVE CIRCUITS.	40	38	40	80	
A	49	A3-26 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR PARALLEL RESISTIVE CIRCUITS.	43	41	40	60	
A	50	A3-27 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR PARALLEL RESISTIVE CIRCUITS.	37	35	35	80	
A	51	A3-28 DO YOU CALCULATE POWER DISSIPATION FOR PARALLEL RESISTIVE CIRCUITS.	30	27	31	40	
B	52	B1-01 DO YOU MEASURE RESISTANCE.	76	70	82	100	
B	53	B1-02 DO YOU REPAIR OHMMETERS.	8	9	6	20	
B	54	B1-03 DO YOU MEASURE VOLTAGE.	80	76	84	100	
B	55	B1-04 DO YOU REPAIR VOLTMETERS.	7	9	5	20	
B	56	B1-05 DO YOU REPAIR AMMETERS.	7	9	5	20	MULTIMETER USES
B	57	B1-06 DO YOU MEASURE CURRENT.	73	69	78	60	
B	58	B1-07 DO YOU USE MULTIMETERS.	80	75	82	100	
B	59	B1-08 DO YOU DIRECTLY USE A QUANTITY OF CHARGE CALLED A COULOMB.	8	8	7	20	
B	60	B1-09 DO YOU READ SCHEMATICS.	77	70	84	100	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
B	61	B2-01 DO YOU USE OR REFER TO THE TERM EFFECTIVE VOLTAGE (RMS).	54	51	53	60	
B	62	B2-02 DO YOU USE OR REFER TO THE TERM PEAK TO PEAK VOLTAGE.	67	61	69	80	ALTERNATING CURRENT
B	63	B2-03 DO YOU USE OR REFER TO THE TERM AVERAGE VOLTAGE (DC).	65	59	68	80	
B	64	B2-04 DO YOU USE OR REFER TO THE TERM WAVE LENGTH.	54	49	59	80	
B	65	B2-05 DO YOU USE OR REFER TO THE TERM FREQUENCY.	78	72	84	80	
B	66	B2-06 DO YOU USE OR REFER TO THE TERM INSTANTANEOUS VALUE.	24	21	27	40	
B	67	B3-01 DO YOU WORK WITH INDUCTORS OR CIRCUITS CONTAINING INDUCTORS, CHOKES, OR CHOKE COILS IN YOUR PRESENT JOB.	64	58	70	100	
B	68	B3-02 DO YOU INSPECT INDUCTORS.	62	59	66	100	
B	69	B3-03 DO YOU CLEAN INDUCTORS.	55	54	58	100	
B	70	B3-04 DO YOU ADJUST INDUCTORS.	53	51	57	100	
B	71	B3-05 DO YOU REMOVE OR REPLACE INDUCTORS.	61	58	65	100	
B	72	B3-06 DO YOU USE OR REFER TO INDUCTANCE.	53	50	55	80	
B	73	B3-07 DO YOU USE OR REFER TO HENRIES.	43	41	40	80	
B	74	B3-08 DO YOU USE OR REFER TO INDUCTIVE REACTANCE.	40	37	40	60	
B	75	B3-09 DO YOU USE OR REFER TO COPPER LOSS IN INDUCTORS.	8	7	8	20	
B	76	B3-10 DO YOU USE OR REFER TO HYSTERESIS LOSS IN INDUCTORS.	9	8	7	20	
B	77	B3-11 DO YOU USE OR REFER TO EDDY CURRENT LOSS IN INDUCTORS	9	9	7	20	
B	78	B3-12 DO YOU USE OR REFER TO THE GENERAL RULE THAT INDUCTANCE IS PROPORTIONAL TO THE SQUARE OF THE NUMBER OF	11	8	14	0	
B	79	B2-13 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE INDUCTANCE OF A COIL IS DIRECTLY PROPORTIONAL TO THE CROSS	8	6	11	0	INDUCTORS AND INDUCTIVE REACTANCE
B	80	B2-14 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE INDUCTANCE OF A COIL IS INVERSELY PROPORTIONAL TO ITS	9	6	11	0	
B	81	B2-15 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE INDUCTANCE OF A COIL IS DIRECTLY PROPORTIONAL TO THE	9	6	12	0	
B	82	B2-16 DO YOU CALCULATE INDUCTANCE FOR PARTICULAR INDUCTORS USING FORMULAS.	11	9	14	0	
B	83	B3-17 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTANCE IN SERIES.	14	10	16	20	
B	84	B3-18 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTORS IN PARALLEL.	14	10	14	20	
B	85	B3-19 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTORS IN SERIES-PARALLEL CIRCUITS.	13	10	14	20	
B	86	B3-20 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT LAGS VOLTAGE IN AC INDUCTOR CIRCUITS.	26	21	30	60	
B	87	B3-21 DO YOU CALCULATE INDUCTIVE REACTANCE.	16	13	17	40	
B	88	B3-22 DO YOU USE OR REFER TO THE GENERAL RULE THAT INDUCTIVE REACTANCE IS DIRECTLY PROPORTIONAL TO FREQUENCY.	22	18	26	40	
B	89	B3-23 DO YOU WORK WITH POWER INDUCTORS.	41	37	44	60	
B	90	B3-24 DO YOU WORK WITH AUDIO FREQUENCY INDUCTORS.	25	23	27	60	
B	91	B3-25 DO YOU WORK WITH RADIO FREQUENCY INDUCTORS.	45	42	45	100	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
C	92	C1-01 DO YOU WORK WITH CAPACITORS OR CIRCUITS CONTAINING CAPACITORS IN YOUR PRESENT JOB.	66	62	71	100	
C	93	C1-02 DO YOU INSPECT CAPACITORS.	70	66	77	100	
C	94	C1-03 DO YOU CLEAN CAPACITORS.	61	59	68	100	
C	95	C1-04 DO YOU ADJUST CAPACITORS.	62	59	63	100	
C	96	C1-05 DO YOU TEST CAPACITORS.	63	59	69	100	
C	97	C1-06 DO YOU DISCHARGE CAPACITORS.	67	63	71	100	
C	98	C1-07 DO YOU REMOVE OR REPLACE CAPACITORS.	69	65	76	100	
C	99	C1-08 DO YOU USE OR REFER TO DISTRIBUTED CAPACITANCE.	15	11	18	40	
C	100	C1-09 DO YOU USE OR REFER TO ORBITAL STRESS OF ELECTRONS IN A DIELECTRIC.	6	3	6	20	
C	101	C1-10 DO YOU USE OR REFER TO FARADS, MICROFARADS, OR PICOFARADS.	63	57	68	100	
C	102	C1-11 DO YOU USE OR REFER TO CAPACITANCE.	63	57	68	100	
C	103	C1-12 DO YOU USE OR REFER TO DIELECTRIC CONSTANT	15	11	16	60	
C	104	C1-13 DO YOU USE OR REFER TO WORKING VOLTAGE RATING OF CAPACITORS	47	44	48	80	
C	105	C1-14 DO YOU USE OR REFER TO CAPACITIVE REACTANCE	32	28	34	60	
C	106	C1-15 DO YOU USE OR REFER TO CAPACITOR COLOR CODES	33	33	30	60	CAPACITORS AND CAPACITIVE REACTANCE
C	107	C1-16 DO YOU WORK WITH CAPACITORS IN DC CIRCUITS	69	64	75	100	
C	108	C1-17 DO YOU WORK WITH CAPACITORS IN AC CIRCUITS	69	63	76	100	
C	109	C1-18 DO YOU WORK WITH CAPACITORS IN CIRCUITS WITH BOTH DC AND AC	64	59	70	80	
C	110	C1-19 DO YOU WORK WITH CAPACITORS IN DON'T REMEMBER WHICH CIRCUITS	15	14	14	40	
C	111	C1-20 DO YOU CALCULATE CAPACITANCE FOR PARTICULAR CAPACITORS USING FORMULAS	13	10	14	20	
C	112	C1-21 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITANCE OF A CAPACITOR IS DIRECTLY PROPORTIONAL TO THE	9	6	11	0	
C	113	C1-22 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITANCE OF A CAPACITOR IS INVERSELY PROPORTIONAL TO	10	6	11	20	
C	114	C1-23 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN SERIES	20	17	22	40	
C	115	C1-24 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN PARALLEL	21	17	24	40	
C	116	C1-25 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN SERIES-PARALLEL CIRCUITS	20	17	20	40	
C	117	C1-26 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT DOES NOT FLOW THROUGH CAPACITORS, IT ONLY APPEARS TO DO SO	30	26	34	40	
C	118	C1-27 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT LEADS VOLTAGE IN AC CAPACITOR CIRCUITS	25	22	29	40	
C	119	C1-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITIVE REACTANCE IS INVERSELY PROPORTIONAL TO	21	17	24	40	
C	120	C1-29 DO YOU CALCULATE CAPACITIVE REACTANCE	14	13	17	40	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
C 121	C1-30	DO YOU WORK WITH ROTOR-STATOR (VARIABLE) CAPACITORS	54	51	55	60	
C 122	C1-31	DO YOU WORK WITH COMPRESSION (TRIMMER) CAPACITORS	49	47	49	40	
C 123	C1-32	DO YOU WORK WITH ELECTROLYTIC (FIXED) CAPACITORS	66	61	71	60	
C 124	C1-33	DO YOU WORK WITH PAPER (FIXED) CAPACITORS	61	58	62	60	
C 125	C1-34	DO YOU WORK WITH MICA (FIXED) CAPACITORS	63	58	67	60	
C 126	C1-35	DO YOU WORK WITH CERAMIC (FIXED) CAPACITORS	65	59	72	60	
C 127	C1-36	DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF CAPACITORS	16	13	19	60	
C 128	C2-01	DO YOU WORK WITH TRANSFORMERS IN YOUR PRESENT JOB	64	57	70	100	
C 129	C2-02	DO YOU INSPECT TRANSFORMERS	66	60	72	100	
C 130	C2-03	DO YOU CLEAN TRANSFORMERS	60	55	68	100	
C 131	C2-04	DO YOU ADJUST TRANSFORMERS	46	46	45	80	
C 132	C2-05	DO YOU TROUBLESHOOT TRANSFORMERS	59	56	65	100	
C 133	C2-06	DO YOU REMOVE OR REPLACE COMPLLTE TRANSFORMERS	63	58	71	100	
C 134	C2-07	DO YOU REMOVE OR REPLACE TRANSFORMER PARTS, SUCH AS THE PRIMARY WINDING	11	10	11	20	
C 135	C2-08	DO YOU MAKE A DISTINCTION BETWEEN MUTUAL INDUCTION AND MUTUAL INDUCTANCE (M)	4	3	5	0	
C 136	C2-09	DO YOU USE THE SYMBOL FOR MUTUAL INDUCTANCE, M	6	4	6	20	
C 137	C2-10	DO YOU REFER TO OR USE THE COEFFICIENT OF COUPLING WHEN WORKING WITH TRANSFORMERS	10	7	11	20	
C 138	C2-11	DO YOU CALCULATE TURNS RATIOS FOR TRANSFORMERS USING CURRENT OR VOLTAGE RATIOS	15	13	17	0	TRANSFORMERS
C 139	C2-12	DO YOU REFER TO REFLECTED IMPEDANCE WHEN WORKING WITH TRANSFORMERS	13	9	14	40	
C 140	C2-13	DO YOU CALCULATE IMPEDANCE INTERACTIONS FOR TRANSFORMERS	7	5	8	0	
C 141	C2-14	DO YOU WORK WITH AUTOTRANSFORMERS	37	35	39	60	
C 142	C2-15	DO YOU WORK WITH POWER TRANSFORMERS	61	55	67	80	
C 143	C2-16	DO YOU WORK WITH AUDIO TRANSFORMERS	31	29	29	60	
C 144	C2-17	DO YOU WORK WITH RADIO FREQUENCY TRANSFORMERS	45	39	50	60	
C 145	C2-18	DO YOU WORK WITH DON'T REMEMBER WHAT TYPE OF TRANSFORMERS	17	13	21	60	
C 146	C2-19	DO YOU CHECK TRANSFORMERS FOR OPEN WINDINGS BY MEASURING RESISTANCE	62	58	66	100	
C 147	C2-20	DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING RESISTANCE	54	55	64	100	
C 148	C2-21	DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING OUTPUT VOLTAGES	52	48	58	100	
C 149	C2-22	DO YOU MEASURE RESISTANCE OF TRANSFORMER WINDINGS TO DETERMINE WHETHER A TRANSFORMER HAS A STEP-UP OR	27	26	24	80	
C 150	C2-23	DO YOU MEASURE OUTPUT VOLTAGE OF TRANSFORMERS TO DETERMINE WHETHER A TRANSFORMER HAS A STEP-UP OR STEP-	36	33	39	80	
C 151	C2-24	DO YOU REFER TO BASIC TRANSFORMER SCHEMATIC SYMBOLS FOR TRANSFORMERS	64	59	71	80	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
C 152	C2-25	DO YOU REFER TO MULTIPLE SECONDARY-WINDINGS SCHEMATIC SYMBOLS FOR TRANSFORMERS	60	56	66	80	
C 153	C2-26	DO YOU REFER TO MULTIPLE TAP SCHEMATIC SYMBOLS FOR TRANSFORMERS	59	55	64	80	
C 154	C2-27	DO YOU REFER TO CENTER TAP SCHEMATIC SYMBOLS FOR TRANSFORMERS	62	58	68	80	
C 155	C2-28	DO YOU REFER TO AIR CORE SCHEMATIC SYMBOLS FOR TRANSFORMERS	42	38	45	80	
C 156	C2-29	DO YOU REFER TO IRON CORE SCHEMATIC SYMBOLS FOR TRANSFORMERS	45	41	49	60	
C 157	C2-30	DO YOU REFER TO COMBINATIONS OF THE ABOVE SCHEMATIC SYMBOLS FOR TRANSFORMERS	52	46	62	100	
C 158	C2-31	DO YOU DETERMINE PHASE RELATIONSHIPS BETWEEN SECONDARY AND PRIMARY VOLTAGES OF TRANSFORMERS USING	37	31	45	60	
C 159	C2-32	DO YOU DETERMINE OR REFER TO THE TYPE OF CORE IN TRANSFORMERS YOU WORK WITH	22	19	20	60	
C 160	C2-33	DO YOU REFER TO OR USE THE GENERAL RULE THAT THE TURNS RATIO OF A TRANSFORMER IS EQUAL TO THE VOLTAGE RATIO	25	22	29	60	
C 161	C2-34	DO YOU USE OR REFER TO STEP-UP OR STEP-DOWN RATIOS FOR TRANSFORMERS	41	34	46	60	
C 162	C2-35	DO YOU CALCULATE VOLTAGE RATIOS FOR TRANSFORMERS USING TURNS RATIOS	19	18	20	20	
C 163	C2-36	DO YOU CALCULATE CURRENT RATIOS FOR TRANSFORMERS USING TURNS RATIOS	14	12	16	20	
C 164	C2-37	DOES YOUR JOB INVOLVE ANY TASKS DEALING WITH THREE PHASE TRANSFORMERS	43	38	48	100	
C 165	C2-38	DO YOU INSPECT THREE PHASE TRANSFORMERS	40	36	42	80	
C 166	C2-39	DO YOU CLEAN OR LUBRICATE THREE PHASE TRANSFORMERS	29	29	24	60	
C 167	C2-40	DO YOU ADJUST THREE PHASE TRANSFORMERS	23	26	15	40	
C 168	C2-41	DO YOU TROUBLESHOOT THREE PHASE TRANSFORMERS	30	29	34	60	
C 169	C2-42	DO YOU REMOVE OR REPLACE COMPLETE THREE PHASE TRANSFORMERS	33	30	38	40	
C 170	C2-43	DO YOU REMOVE OR REPLACE THREE PHASE TRANSFORMER PARTS SUCH AS WINDINGS	10	9	12	20	
C 171	C3-01	DO YOU USE OR REFER TO PERMANENT MAGNETS	48	45	55	100	
C 172	C3-02	DO YOU USE OR REFER TO TEMPORARY MAGNETS	25	24	24	80	
C 173	C3-03	DO YOU USE OR REFER TO RETENTIVITY OF MAGNETIC MATERIALS	10	7	10	80	
C 174	C3-04	DO YOU USE OR REFER TO RELUCTANCE OF MAGNETIC MATERIALS	10	7	11	80	
C 175	C3-05	DO YOU USE OR REFER TO PERMEABILITY OF MAGNETIC MATERIALS	12	10	10	80	
C 176	C3-06	DO YOU USE OR REFER TO RESIDUAL MAGNETISM	13	12	10	80	MAGNETISM
C 177	C3-07	DO YOU USE OR REFER TO MAGNETIC LINES OF FORCE OR FLUX	21	21	18	80	
C 178	C3-08	DO YOU USE OR REFER TO WEBER'S THEORY OF MAGNETISM	5	4	4	20	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
C	179	C3-09 DO YOU USE OR REFER TO DOMAIN THEORY OF MAGNETISM	5	4	5	20	
C	180	C3-10 DO YOU USE OR REFER TO MAGNETIC INDUCTION	18	18	16	60	
C	181	C3-11 DO YOU USE OR REFER TO FLUX DENSITY	16	16	12	80	
C	182	C3-12 DO YOU USE OR REFER TO THE GENERAL RULE THAT FOR MAGNETIC POLES, LIKE POLES REPEL AND UNLIKE POLES ATTRACT	39	37	40	80	
C	183	C3-13 DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE DIRECTION OF MAGNETIC FIELDS ABOUT STRAIGHT WIRES	22	20	22	80	
C	184	C3-14 DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE NORTH POLE OF A CURRENT CARRYING COIL	19	18	18	60	
D	185	D1-01 DO YOU WORK WITH RC, LR, RCL CIRCUITS IN YOUR PRESENT JOB	46	39	52	80	
D	186	D1-02 DO YOU USE OR REFER TO VECTORS WHEN WORKING WITH RCL CIRCUITS	17	15	17	80	
D	187	D1-03 DO YOU USE OR REFER TO PYTHAGOREAN THEOREM WHEN WORKING WITH RCL CIRCUITS	17	14	16	80	
D	188	D1-04 DO YOU USE OR REFER TO SINE WHEN WORKING WITH RCL CIRCUITS	24	22	24	80	
D	189	D1-05 DO YOU USE OR REFER TO COSINE WHEN WORKING WITH RCL CIRCUITS	24	22	24	80	
D	190	D1-06 DO YOU USE OR REFER TO TANGENT WHEN WORKING WITH RCL CIRCUITS	20	17	23	80	
D	191	D1-07 DO YOU USE OR REFER TO WATTS WHEN WORKING WITH RCL CIRCUITS	33	27	34	80	
D	192	D1-08 DO YOU USE OR REFER TO TRUE POWER (PT) WHEN WORKING WITH RCL CIRCUITS	20	15	23	80	RCL CIRCUITS
D	193	D1-09 DO YOU USE OR REFER TO MAXIMUM POWER (PM) WHEN WORKING WITH RCL CIRCUITS	21	15	25	80	
D	194	D1-10 DO YOU USE OR REFER TO AVERAGE POWER (PAVE) WHEN WORKING WITH RCL CIRCUITS	28	24	29	80	
D	195	D1-11 DO YOU USE OR REFER TO APPARENT POWER (PA) WHEN WORKING WITH RCL CIRCUITS	16	12	18	80	
D	196	D1-12 DO YOU USE OR REFER TO POWER FACTOR (PF) WHEN WORKING WITH RCL CIRCUITS	15	12	16	80	
D	197	D1-13 DO YOU USE OR REFER TO RESONANT CIRCUITS WHEN WORKING WITH RCL CIRCUITS	35	29	39	80	
D	198	D1-14 DO YOU USE OR REFER TO BANDWIDTH WHEN WORKING WITH RCL CIRCUITS	41	34	46	80	
D	199	D1-15 DO YOU USE OR REFER TO SELECTIVITY WHEN WORKING WITH RCL CIRCUITS	36	29	40	80	
D	200	D1-16 DO YOU USE OR REFER TO RESONANT FREQUENCY WHEN WORKING WITH RCL CIRCUITS	38	31	44	80	
D	201	D1-17 DO YOU USE OR REFER TO HALF POWER POINTS WHEN WORKING WITH RCL CIRCUITS	27	25	25	60	
D	202	D1-18 DO YOU USE OR REFER TO BANDPASS REGION WHEN WORKING WITH RCL CIRCUITS	29	24	32	60	
D	203	D1-19 DO YOU USE OR REFER TO CIRCUIT Q WHEN WORKING WITH RCL CIRCUITS	17	13	18	60	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
D 204	D1-20 DO YOU USE OR REFER TO TANK CIRCUITS WHEN WORKING WITH RCL CIRCUITS	34	27	39	60
D 205	D1-21 DO YOU DETERMINE VALUES OF TRIGONOMETRIC FUNCTIONS USING FORMULAS	21	19	20	60
D 206	D1-22 DO YOU DRAW VOLTAGE, CURRENT, OR IMPEDANCE VECTOR DIAGRAMS FOR CIRCUITS	9	7	9	20
D 207	D1-23 DO YOU CALCULATE TOTAL IMPEDANCE FOR CAPACITIVE CIRCUITS	10	8	11	20
D 208	D1-24 DO YOU CALCULATE PHASE ANGLES BETWEEN IMPEDANCE AND RESISTANCE IN CAPACITIVE CIRCUITS	8	6	6	20
D 209	D1-25 DO YOU CALCULATE TOTAL IMPEDANCE FOR SERIES RCL CIRCUITS	10	8	10	20
D 210	D1-26 DO YOU CALCULATE IMPEDANCE ANGLES FOR SERIES RCL CIRCUITS	6	4	6	20
D 211	D1-27 DO YOU CALCULATE APPARENT POWER (PA) FOR SERIES RCL CIRCUITS	8	6	6	20
D 212	D1-28 DO YOU CALCULATE TRUE POWER (PT) FOR SERIES RCL CIRCUITS	9	6	7	20
D 213	D1-29 DO YOU CALCULATE POWER FACTORS (PF) FOR SERIES RCL CIRCUITS	9	7	7	20
D 214	D1-30 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RCL CIRCUITS	12	9	13	20
D 215	D1-31 DO YOU CALCULATE IMPEDANCE ANGLES FOR PARALLEL RCL CIRCUITS	7	5	7	20
D 216	D1-32 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING THE ASSUMED VOLTAGE METHOD	7	5	7	20
D 217	D1-33 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING OHM'S LAW	14	10	14	40
D 218	D1-34 DO YOU CHECK CAPACITORS USING OHMMETERS	46	41	48	60
D 219	D1-35 DO YOU CHECK CAPACITORS USING SUBSTITUTION	34	31	38	40
D 220	D1-36 DO YOU CHECK INDUCTORS USING OHMMETERS	44	40	47	40
D 221	D1-37 DO YOU CHECK INDUCTORS USING SUBSTITUTION	31	29	31	40
D 222	D1-38 DO YOU USE OR REFER TO THE GENERAL RULE THAT THETA= 0, PF = 1, AND PA = PT FOR RESONANT CIRCUITS	4	3	5	0
D 223	D1-39 DO YOU CALCULATE RESONANT FREQUENCIES FOR RCL CIRCUITS	13	8	16	20
D 224	D1-40 DO YOU USE OR REFER TO THE GENERAL RULE THAT IMPEDANCE IS MINIMUM AND CURRENT MAXIMUM AT THE RESONANT	16	12	18	20
D 225	D1-41 DO YOU USE OR REFER TO THE GENERAL RULE THAT LINE CURRENT IS MINIMUM AND IMPEDANCE MAXIMUM AT RESONANT	13	10	14	40
D 226	D1-42 DO YOU USE OR REFER TO THE GENERAL RULE THAT HALF POWER POINTS ARE AT 70.7 PERCENT OF THE PEAK CURRENT VALUE	30	27	30	60
D 227	D1-43 DO YOU USE OR REFER TO THE GENERAL RULE THAT BANDWIDTH IS INVERSELY PROPORTIONAL TO Q	13	11	14	40
D 228	D1-44 DO YOU DETERMINE HOW CHANGES IN FREQUENCY, RESISTANCE, CAPACITANCE, OR INDUCTANCE WILL AFFECT CURRENT OR PHASE	12	9	14	40

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
D	229	D2-01 IN YOUR PRESENT JOB, DO YOU WORK WITH, USE, OR REFER TO SERIES OR PARALLEL RESONANT CIRCUITS OR TIME CONSTANTS	30	28	28	60	
D	230	D2-02 DO YOU WORK WITH, USE, OR REFER TO TIME CONSTANTS	24	21	25	60	
D	231	D2-03 DO YOU WORK WITH, USE, OR REFER TO AVAILABLE VOLTAGE	13	12	14	40	
D	232	D3-04 DO YOU WORK WITH, USE, OR REFER TO TRANSIENT INTERVALS	10	9	11	20	
D	233	D2-05 DO YOU USE OR REFER TO THE GENERAL RULE THAT A CAPACITOR IS FULLY CHARGED (OR DISCHARGED) AFTER FIVE (5)	18	14	19	60	SERIES AND PARALLEL RESONANCE (TIME CONSTANTS)
D	234	D2-06 DO YOU USE OR REFER TO UNIVERSAL TIME CONSTANT CHARTS	9	8	9	60	
D	235	D2-07 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CIRCUIT CURRENT OR COMPONENT VOLTAGES AFTER A SPECIFIC	9	6	9	20	
D	236	D2-08 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE THE TIME REQUIRED FOR CIRCUIT CURRENT OR COMPONENT VOLTAGES TO	10	7	10	40	
D	237	D2-09 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE COMPONENT VALUES REQUIRED FOR CIRCUIT CURRENT AND	9	6	9	60	
D	238	D2-10 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT IN LR CIRCUITS REACHES ITS MINIMUM VALUE (OR ZERO) AFTER	10	8	12	40	
D	239	D3-01 DO YOU WORK WITH CIRCUITS USED AS FILTERS IN YOUR PRESENT JOB	50	45	54	80	
D	240	D3-02 DO YOU INSPECT FILTER CIRCUITS	47	43	51	80	
D	241	D3-03 DO YOU CLEAN FILTER CIRCUITS	42	40	45	80	
D	242	D3-04 DO YOU ALIGN OR ADJUST FILTER CIRCUITS	35	30	41	80	
D	243	D3-05 DO YOU TROUBLESHOOT TO THE FILTER CIRCUIT LEVEL	40	35	44	80	
D	244	D3-06 DO YOU TROUBLESHOOT TO COMPONENT PARTS	43	39	50	80	
D	245	D3-07 DO YOU REMOVE OR REPLACE THE COMPLETE FILTER CIRCUIT	39	36	42	80	
D	246	D3-08 DO YOU REMOVE OR REPLACE FILTER CIRCUIT COMPONENT PARTS	43	38	48	80	
D	247	D3-09 DO YOU WORK WITH LOW PASS FILTERS	41	35	43	80	
D	248	D3-10 DO YOU WORK WITH HIGH PASS FILTERS	40	34	42	80	
D	249	D3-11 DO YOU WORK WITH BANDPASS FILTERS	42	35	45	80	
D	250	D3-12 DO YOU WORK WITH BAND-REJECT FILTERS	32	27	33	60	FILTERS
D	251	D3-13 DON'T REMEMBER WHICH TYPE OF FILTER YOU WORK WITH	17	16	17	40	
D	252	D3-14 DO YOU WORK WITH L-SECTION FILTER CONFIGURATION	27	25	26	20	
D	253	D3-15 DO YOU WORK WITH T-SECTION FILTER CONFIGURATION	27	24	27	20	
D	254	D3-16 DO YOU WORK WITH PI-SECTION FILTER CONFIGURATION	26	25	28	20	
D	255	D3-17 DON'T REMEMBER WHICH TYPE FILTER CONFIGURATION	24	22	29	40	
D	256	D3-18 DO THE FILTERS YOU WORK WITH USE PARALLEL RESONANT CIRCUITS	28	24	30	40	
D	257	D3-19 DO THE FILTERS YOU WORK WITH USE SERIES-PARALLEL CIRCUITS	29	25	29	40	
D	258	D3-20 DO THE FILTERS YOU WORK WITH USE SERIES RESONANT CIRCUITS	26	24	31	40	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
D	259	D3-21 DON'T REMEMBER WHICH TYPE OF BASIC CIRCUIT	24	23	27	20	
D	260	D3-22 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CAPACITANCE OR INDUCTANCE VALUES REQUIRED FOR SPECIFIC	10	9	10	0	
E	261	E1-01 DO YOU WORK WITH COUPLING DEVICES IN YOUR PRESENT JOB	50	45	53	60	
E	262	E1-02 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH RC	48	43	48	60	
E	263	E1-03 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	45	39	48	80	
E	264	E1-04 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	50	44	53	80	
E	265	E1-05 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM RC COUPLING	46	41	47	80	
E	266	E1-06 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM IMPEDANCE COUPLING	44	38	49	60	COUPLING
E	267	E1-07 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM TRANSFORMER COUPLING	48	43	53	80	
E	268	E1-08 DO YOU WORK WITH DIRECTLY COUPLED CIRCUITS	45	40	50	80	
E	269	E1-09 DO YOU WORK WITH CAPACITIVE-RESISTIVE COUPLED CIRCUITS	44	39	47	60	
E	270	E1-10 DO YOU WORK WITH CAPACITIVE-INDUCTIVE COUPLED CIRCUITS	40	36	42	60	
E	271	E1-11 DO YOU WORK WITH TRANSFORMER COUPLED CIRCUITS	45	40	48	80	
E	272	E1-12 DON'T REMEMBER WHICH TYPE OF COUPLING CIRCUITS	13	11	15	40	
E	273	E2-01 IN YOUR PRESENT JOB, DO YOU PERFORM SOLDERING TECHNIQUES OR INSPECT OR EVALUATE SOLDERED CONNECTIONS	67	62	75	100	
E	274	E2-02 DO YOU SELECT TYPE OF SOLDER TO USE	56	51	66	60	
E	275	E2-03 DO YOU ADD FLUX TO CONNECTIONS	54	47	68	100	
E	276	E2-04 DO YOU CLEAN CONNECTIONS USING SOLVENTS	61	52	74	100	
E	277	E2-05 DO YOU STRIP INSULATION FROM WIRES	70	62	81	100	
E	278	E2-06 DO YOU CONNECT OR DISCONNECT HEAT SINKS	66	59	76	100	
E	279	E2-07 DO YOU BEND OR SHAPE WIRES OR LEADS	70	62	81	100	
E	280	E2-08 DO YOU CUT WIRES	69	62	80	100	
E	281	E2-09 DO YOU FILE OR SHAPE SOLDERING IRON TIPS	59	54	68	100	
E	282	E2-10 DO YOU TIN SOLDERING IRON TIPS	68	62	77	100	
E	283	E2-11 DO YOU CLEAN SOLDERING IRON TIPS	69	62	80	100	SOLDERING
E	284	E2-12 DO YOU CLEAN ELECTRICAL SURFACES USING ERASERS	61	56	67	60	
E	285	E2-13 DO YOU TIN OR PRE-TIN CONDUCTORS	66	59	77	100	
E	286	E2-14 DO YOU INSPECT SOLDERED CONNECTIONS	70	63	81	100	
E	287	E2-15 DO YOU DESOLDER CONNECTIONS BY WICKING	61	55	66	100	
E	288	E2-16 DO YOU DESOLDER CONNECTIONS USING VACUUM DESOLDERING TOOLS	50	50	40	60	
E	289	E2-17 DO YOU CUT COMPONENT LEADS TO REMOVE COMPONENTS	55	49	63	100	
E	290	E2-18 DO YOU CRUSH COMPONENTS FOR REMOVAL	20	18	24	60	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

			DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
E	291	E2-19	DO YOU MAKE HARDWIRE CONNECTIONS	64	58	72	80	
E	292	E2-20	DO YOU MAKE PRINTED CIRCUIT BOARD CONNECTIONS	52	53	44	80	
E	293	E2-21	DO YOU SOLDER PASSIVE COMPONENTS SUCH AS RESISTORS OR CAPACITORS ON PRINTED CIRCUIT BOARDS	53	53	45	100	
E	294	E2-22	DO YOU SOLDER ACTIVE COMPONENTS SUCH AS SOLID-STATE DIODES OR TRANSISTORS ON PRINTED CIRCUIT BOARDS	50	52	40	100	
E	295	E3-01	DO YOU WORK WITH RELAYS ON YOUR PRESENT JOB	65	59	70	100	
E	296	E3-02	DO YOU ADJUST RELAYS	42	40	40	60	
E	297	E3-03	DO YOU CLEAN RELAYS	58	54	63	100	
E	298	E3-04	DO YOU INSPECT RELAYS	63	57	68	100	
E	299	E3-05	DO YOU REMOVE OR REPLACE COMPLETE RELAYS	64	58	75	100	
E	300	E3-06	DO YOU REMOVE OR REPLACE PARTS OR RELAYS	25	26	16	100	
E	301	E3-07	DO YOU TROUBLESHOOT RELAYS	61	56	70	100	
E	302	E3-08	DO YOU STRAIGHTEN RELAY CONTACTS	42	42	39	100	
E	303	E3-09	DO YOU PERFORM TASKS ON RELAY CONTACTS	47	49	40	100	
E	304	E3-10	DO YOU PERFORM TASKS ON RELAY CORES	15	18	7	60	
E	305	E3-11	DO YOU PERFORM TASKS ON RELAY COILS	20	23	12	80	
E	306	E3-12	DO YOU PERFORM TASKS ON RELAY ARMATURES	25	30	12	80	RELAYS
E	307	E3-13	DO YOU PERFORM TASKS ON RELAY SPRINGS	29	34	16	80	
E	308	E3-14	DO YOU USE OR REFER TO SINGLE POLE, SINGLE THROW (SPST), NORMALLY OPER (NO) SCHEMATIC SYMBOLS FOR RELAYS	54	50	58	80	
E	309	E3-15	DO YOU USE OR REFER TO SINGLE POLE, SINGLE THROW (SPST), NORMALLY CLOSED (NC) SCHEMATIC SYMBOLS FOR RELAYS	55	50	59	80	
E	310	E3-16	DO YOU USE OR REFER TO SINGLE POLE, DOUBLE THROW (SPDT) SCHEMATIC SYMBOLS FOR RELAYS	52	48	57	60	
E	311	E3-17	DO YOU USE OR REFER TO DOUBLE POLE, DOUBLE THROW (DPDT) SCHEMATIC SYMBOLS FOR RELAYS	53	48	58	60	
E	312	E3-18	DO YOU USE OR REFER TO OTHER RELAY SYMBOLS SCHEMATIC SYMBOLS FOR RELAYS	52	49	52	80	
E	313	E3-19	DO YOU CHECK ELECTRICAL CONTINUITY OF COILS BY MEASURING RESISTANCE	56	52	61	60	
F	314	F1-01	IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH MICROPHONES	27	22	30	20	
F	315	F1-02	DO YOU INSPECT MICROPHONES	13	8	16	20	
F	316	F1-03	DO YOU CLEAN MICROPHONES	10	5	14	20	
F	317	F1-04	DO YOU OPERATE MICROPHONES	27	22	31	20	
F	318	F1-05	DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT	15	11	15	20	MICROPHONES
F	319	F1-06	DO YOU TROUBLESHOOT DOWN TO MICROPHONE PARTS	4	3	4	20	
F	320	F1-07	DO YOU REMOVE OR REPLACE COMPLETE MICROPHONES	15	13	12	20	
F	321	F1-08	DO YOU REMOVE OR REPLACE MICROPHONE PARTS	4	2	5	20	
F	322	F1-09	DO YOU PERFORM TASKS ON CARBON MICROPHONES	14	14	11	20	
F	323	F1-10	DO YOU PERFORM TASKS ON CAPACITOR MICROPHONES	3	2	3	20	
F	324	F1-11	DO YOU PERFORM TASKS ON CRYSTAL MICROPHONES	4	4	3	0	
F	325	F1-12	DO YOU PERFORM TASKS ON DYNAMIC MICROPHONES	10	7	11	0	
F	326	F1-13	DO YOU PERFORM TASKS ON VELOCITY RIBBON MICROPHONES	1	1	2	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
F	327	F2-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH SPEAKERS	24	22	24	20	
F	328	F2-02 DO YOU INSPECT SPEAKERS	16	12	19	20	
F	329	F2-03 DO YOU CLEAN SPEAKERS	12	6	15	20	
F	330	F2-04 DO YOU OPERATE SPEAKERS	24	21	24	20	
F	331	F2-05 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT	14	10	16	20	SPEAKERS
F	332	F2-06 DO YOU TROUBLESHOOT DOWN TO SPEAKER PARTS	4	4	3	20	
F	333	F2-07 DO YOU REMOVE OR REPLACE COMPLETE SPEAKERS	13	11	14	20	
F	334	F2-08 DO YOU REMOVE OR REPLACE SPEAKER PARTS	4	5	3	20	
F	335	F2-09 DO YOU PERFORM ANY TASKS ON SPEAKER CONES	3	3	2	20	
F	336	F2-10 DO YOU PERFORM ANY TASKS ON SPEAKER SPIDERS	1	1	1	20	
F	337	F2-11 DO YOU PERFORM ANY TASKS ON SPEAKER FIELD COILS	2	2	1	20	
F	338	F2-12 DO YOU PERFORM ANY TASKS ON SPEAKER VOICE COILS	2	2	1	20	
F	339	F2-13 DO YOU PERFORM ANY TASKS ON SPEAKER PERMANENT MAGNETS	2	2	1	20	
F	340	F2-14 DO YOU PERFORM ANY TASKS ON SPEAKER ELECTROMAGNETS	2	2	1	20	
F	341	F2-15 DO YOU PERFORM ANY TASKS ON SPEAKER SOFT IRON CORES	1	2	0	20	
F	342	F3-01 DO YOU USE OSCILLOSCOPES IN YOUR PRESENT JOB	73	68	76	100	
F	343	F3-02 DO YOU USE OSCILLOSCOPES TO PERFORM OPERATIONAL CHECKS	72	68	76	100	
F	344	F3-03 DO YOU USE OSCILLOSCOPES TO PERFORM ALIGNMENTS OR ADJUSTMENTS	71	65	77	100	
F	345	F3-04 DO YOU USE OSCILLOSCOPES TO TROUBLESHOOT ELECTRONIC CIRCUITS	66	59	75	100	
F	346	F3-05 DO YOU USE OSCILLOSCOPES TO MEASURE FREQUENCY	69	63	77	80	
F	347	F3-06 DO YOU USE OSCILLOSCOPES TO MEASURE TIME	71	65	76	100	OSCILLOSCOPES
F	348	F3-07 DO YOU USE OSCILLOSCOPES TO OBSERVE LISAJOUS PATTERNS	42	38	38	60	
F	349	F3-08 DO YOU USE OSCILLOSCOPES TO OBSERVE SIGNALS WHILE UTILIZING ATTENUATOR PROBES	71	65	77	100	
F	350	F3-09 DO YOU USE OSCILLOSCOPES TO MAKE FREQUENCY OR TIME MEASUREMENTS USING DELAY TIME MULTIPLIERS	44	38	51	80	
F	351	F3-10 DO YOU USE OSCILLOSCOPES TO MEASURE AC VOLTAGE	67	61	74	100	
F	352	F3-11 DO YOU USE OSCILLOSCOPES TO MEASURE OR OBSERVE SIGNALS AFTER FIRST ADJUSTING THE GAIN AND DC BAL CONTROLS	54	47	57	80	
F	353	F3-12 DO YOU USE OSCILLOSCOPES TO MEASURE DC VOLTAGE	65	58	70	100	
G	354	G1-01 DO YOU WORK WITH SEMICONDUCTOR DIODES IN YOUR PRESENT JOB	56	54	57	100	
G	355	G1-02 DO YOU INSPECT DIODES	56	53	54	100	
G	356	G1-03 DO YOU REMOVE OR REPLACE DIODES	57	53	59	100	
G	357	G1-04 DO YOU CHECK DIODES USING AN INSTRUMENT	54	52	50	100	
G	358	G1-05 DO YOU USE ENERGY LEVEL DIAGRAMS IN YOUR WORK WITH DIODES	5	4	4	20	
G	359	G1-06 DO YOU USE PN JUNCTION DIODE CHARACTERISTIC CURVES, TOGETHER WITH VALUES OF FORWARD AND REVERSE BIAS VOLTAGE,	8	6	6	40	
G	360	G1-07 DO YOU COMPUTE FORWARD OR REVERSE BIAS RESISTANCE FOR DIODES	15	12	15	40	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
G 361	G1-08	DO YOU USE OR REFER TO THE GENERAL RULE THAT TEMPERATURE CAN AFFECT THE OPERATION OF DIODES	38	36	35	80
G 362	G1-09	DO YOU IDENTIFY SEMICONDUCTOR DIODES AS OPPOSED TO OTHER ELECTRONIC COMPONENTS, SUCH AS RESISTORS, BASED ON	50	46	50	80
G 363	G1-10	DO YOU REFER TO OR DO YOU DETERMINE THE GENERAL EFFECTS OF DOPING ON CURRENT FLOW	10	8	11	40
G 364	G1-11	DO YOU USE OR REFER TO MEASUREMENTS OF FORWARD BIAS RESISTANCE	41	41	35	100
G 365	G1-12	DO YOU USE OR REFER TO DIODE COLOR CODING	21	20	17	80
G 366	G1-13	DO YOU USE OR REFER TO CENTRIFUGAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	4	2	4	20
G 367	G1-14	DO YOU USE OR REFER TO CENTRIPETAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	4	2	3	20
G 368	G1-15	DO YOU USE OR REFER TO DIODE NUMBERING SYSTEM, SUCH AS IN 538	43	41	43	80
G 369	G1-16	DO YOU USE OR REFER TO KINETIC ENERGY OF AN ELECTRON MOVING IN ORBIT	5	3	4	20
G 370	G1-17	DO YOU USE OR REFER TO POTENTIAL ENERGY OF AN ELECTRON MOVING IN ORBIT	4	3	3	20
G 371	G1-18	DO YOU USE OR REFER TO MEASUREMENTS OF REVERSE BIAS RESISTANCE	40	39	35	80
G 372	G1-19	DO YOU USE OR REFER TO NUMBER OF ELECTRONS IN A PARTICULAR SHELL OR ORBIT	5	2	4	20
G 373	G1-20	DO YOU USE OR REFER TO PERMISSIBLE ENERGY LEVELS OF AN ORBITING ELECTRON	4	2	4	20
G 374	G1-21	DO YOU USE OR REFER TO FORBIDDEN ENERGY LEVELS OF AN ORBITING ELECTRON	4	2	4	20
G 375	G1-22	DO YOU USE OR REFER TO VALENCE ELECTRONS (THOSE IN THE OUTERMOST SHELL)	6	4	5	20
G 376	G1-23	DO YOU USE OR REFER TO ATOMIC NUMBER (TOTAL NUMBER OF ELECTRONS IN ATOM)	5	3	4	20
G 377	G1-24	DO YOU USE OR REFER TO SYMBOLS ON THE DIODE WHICH INDICATE THE CATHODE END	49	45	47	80
G 378	G1-25	DO YOU NEED TO KNOW WHICH MATERIALS ARE USED IN THE CONSTRUCTION OF DIODES SUCH AS GERMANIUM OR SILICON	16	14	14	0
G 379	G1-26	DO YOU NEED TO KNOW THAT SEMICONDUCTORS HAVE NEGATIVE TEMPERATURE COEFFICIENTS OF RESISTANCE (AS TEMPERATURE	22	20	19	20
G 380	G1-27	DO YOU USE OR REFER TO PN JUNCTION DIODE CHARACTERISTIC CURVES, SUCH AS VOLTAGE - CURRENT	9	6	9	20
G 381	G1-28	DO YOU DETERMINE WHETHER PN JUNCTION DIODES ARE FORWARD BIASED OR REVERSE BIASED WHEN YOU READ OR	37	33	40	20
G 382	G1-29	DO YOU USE OR REFER TO VALENCE BAND IN SEMICONDUCTOR MATERIALS	6	4	5	20

SEMICONDUCTOR DIODES

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
G 383	G1-30 DO YOU USE OR REFER TO FORBIDDEN BAND IN SEMICONDUCTOR MATERIALS	5	3	4	20
G 384	G1-31 DO YOU USE OR REFER TO CONDUCTION BAND IN SEMICONDUCTOR MATERIALS	5	4	4	20
G 385	G1-32 DO YOU USE OR REFER TO COVALENT BONDING IN SEMICONDUCTOR MATERIALS	5	3	5	20
G 386	G1-33 DO YOU USE OR REFER TO ELECTRON-HOLE PAIR CREATED IN SEMICONDUCTORS	6	4	6	20
G 387	G1-34 DO YOU USE OR REFER TO ELECTRON FLOW OR HOLE FLOW IN SEMICONDUCTORS	11	8	12	20
G 388	G1-35 DO YOU USE OR REFER TO DONOR IMPURITY IN SEMICONDUCTORS	6	4	4	20
G 389	G1-36 DO YOU USE OR REFER TO ACCEPTOR IMPURITY IN SEMICONDUCTORS	6	4	5	20
G 390	G1-37 DO YOU USE OR REFER TO P-TYPE SEMICONDUCTOR MATERIAL	19	15	19	40
G 391	G1-38 DO YOU USE OR REFER TO N-TYPE SEMICONDUCTOR MATERIAL	18	15	17	40
G 392	G1-39 DO YOU USE OR REFER TO MAJORITY CARRIERS IN SEMICONDUCTORS	7	5	7	20
G 393	G1-40 DO YOU USE OR REFER TO MINORITY CARRIERS IN SEMICONDUCTORS	7	5	7	20
G 394	G1-41 DO YOU USE OR REFER TO JUNCTION RECOMBINATION IN SEMICONDUCTORS	6	4	5	20
G 395	G1-42 DO YOU USE OR REFER TO DEPLETION REGION IN SEMICONDUCTORS	7	4	6	20
G 396	G1-43 DO YOU USE OR REFER TO RELATIONSHIP BETWEEN BARRIER WIDTH AND DIFFERENCE OF POTENTIAL	6	4	6	20
G 397	G1-44 DO YOU USE OR REFER TO THE 10:1 BACK TO FRONT RESISTANCE RATIO FOR DIODES	42	44	33	80
G 398	G1-45 DO YOU USE OR REFER TO BARRIER HEIGHT IN SEMICONDUCTORS	5	3	4	20
G 399	G1-46 DO YOU USE OR REFER TO DIODE SUBSTITUTION INFORMATION	32	33	25	20
G 400	G1-47 DO YOU USE OR REFER TO MAXIMUM AVERAGE FORWARD CURRENT DIODE RATINGS	19	16	19	40
G 401	G1-48 DO YOU USE OR REFER TO PEAK RECURRENT FORWARD CURRENT DIODE RATINGS	15	11	16	40
G 402	G1-49 DO YOU USE OR REFER TO MAXIMUM SURGE CURRENT DIODE RATINGS	17	14	15	40
G 403	G1-50 DO YOU USE OR REFER TO PEAK REVERSE (INVERSE) VOLTAGE DIODE RATINGS	21	18	20	40
G 404	G2-01 DO YOU WORK WITH TRANSISTORS IN YOUR PRESENT JOB.	46	43	40	60
G 405	G2-02 DO YOU INSPECT TRANSISTORS	45	44	40	60
G 406	G2-03 DO YOU REMOVE OR REPLACE TRANSISTORS	46	44	40	60
G 407	G2-04 DO YOU CHECK TRANSISTORS USING AN INSTRUMENT	43	41	39	40
G 408	G2-05 DO YOU USE OR REFER TO EMITTER - BASE (EB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	38	35	34	40
G 409	G2-06 DO YOU USE OR REFER TO COLLECTOR - BASE (CB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	38	34	35	40

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
G 410	G2-07 DO YOU USE OR REFER TO EMITTER - COLLECTOR (EC) RESISTANCE MEASUREMENTS	38	34	35	40	
G 411	G2-08 DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE EMITTER - BASE JUNCTION	14	11	13	20	TRANSISTORS
G 412	G2-09 DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE COLLECTOR - BASE JUNCTION	14	10	13	20	
G 413	G2-10 DO YOU USE OR REFER TO THE PHYSICAL SIZE OF THE TRANSISTOR STRUCTURE (COLLECTOR, BASE AND EMITTER)	23	21	22	40	
G 414	G2-11 DO YOU USE OR REFER TO LEAKAGE CURRENT (ICBO) IN A TRANSISTOR	19	16	16	20	
G 415	G2-12 DO YOU USE OR REFER TO TRANSISTOR SCHEMATIC SYMBOLS	45	41	39	40	
G 416	G2-13 DO YOU USE OR REFER TO TRANSISTOR NOTATION SUCH AS Q1, Q2, Q3, ETC	45	43	40	20	
G 417	G2-14 DO YOU USE OR REFER TO TRANSISTOR SUBSTITUTION INFORMATION	34	33	27	20	
G 418	G2-15 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE TRANSISTOR BASE CURRENT I_B IS NORMALLY SIGNIFICANTLY	17	16	15	20	
G 419	G2-16 DO YOU USE THE INFORMATION THAT THE EFFECT OF EMITTER BASE VOLTAGE ON BASE CURRENT IS THE CONTROLLING FACTOR FOR	23	20	20	20	
G 420	G2-17 DO YOU USE THE GENERAL RULE THAT LEAKAGE CURRENT (ICBO) IN A TRANSISTOR INCREASES AS TEMPERATURE INCREASES	17	14	16	20	
G 421	G2-18 DO YOU USE OR REFER TO TRANSISTOR CHARACTERISTIC CURVES	11	8	7	20	
G 422	G2-19 DO YOU USE OR REFER TO BETA TRANSISTOR GAINS	15	15	9	20	
G 423	G2-20 DO YOU USE OR REFER TO ALPHA TRANSISTOR GAINS	13	12	8	20	
G 424	G2-21 DO YOU USE OR REFER TO GAMMA TRANSISTOR GAINS	12	11	7	20	
G 425	G2-22 DO YOU CALCULATE BETA TRANSISTOR GAINS	7	5	4	0	
G 426	G2-23 DO YOU CALCULATE ALPHA TRANSISTOR GAINS	6	5	4	0	
G 427	G2-24 DO YOU CALCULATE GAMMA TRANSISTOR GAINS	5	4	4	0	
G 428	G3-01 DO YOU WORK WITH TRANSISTOR AMPLIFIERS IN YOUR PRESENT JOB	34	29	32	40	
G 429	G3-02 DO YOU INSPECT TRANSISTOR AMPLIFIERS	32	28	30	20	
G 430	G3-03 DO YOU ALIGN OR ADJUST TRANSISTOR AMPLIFIERS	28	25	28	20	
G 431	G3-04 DO YOU TROUBLESHOOT TO THE AMPLIFIER CIRCUIT LEVEL	31	26	30	20	TRANSISTOR AMPLIFIERS
G 432	G3-05 DO YOU TROUBLESHOOT TO AMPLIFIER COMPONENTS	30	27	27	20	
G 433	G3-06 DO YOU REMOVE OR REPLACE THE COMPLETE AMPLIFIER	31	27	30	20	
G 434	G3-07 DO YOU REMOVE OR REPLACE AMPLIFIER COMPONENTS	29	27	27	20	
G 435	G3-08 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN COLLECTOR CURRENT WHICH RESULTS FROM A CHANGE IN BASE	14	10	16	20	
G 436	G3-09 DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN	9	5	9	20	

TASK GROUP SUMMARY
PERSONNEL PERFORMING

	DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
0 437	03-10 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN COLLECTOR VOLTAGE WHICH RESULTS FROM A CHANGE IN BASE	13	9	16	20
0 438	03-11 DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN	8	5	7	0
0 439	03-12 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN BASE CURRENT WHICH RESULTS FROM AN INPUT SIGNAL	13	8	13	20
0 440	03-13 DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN	8	5	7	0
0 441	03-14 DO YOU USE THE LOAD-LINE METHOD OF ANALYSIS IN YOUR CIRCUIT ANALYSIS (THIS METHOD REQUIRES YOU TO PLOT A	5	4	2	0
0 442	03-15 DO YOU USE OR REFER TO THE OPERATING POINT (QUIESCENT POINT) FOR A TRANSISTOR	11	9	11	0
0 443	03-16 DO YOU CALCULATE THE SPECIFIC QUIESCENT POINT FOR A PARTICULAR TRANSISTOR	6	4	5	0
0 444	03-17 DO YOU MEASURE VOLTAGE GAIN USED IN THE COMMON EMITTER CONFIGURATION	20	16	20	0
0 445	03-18 DO YOU MEASURE CURRENT GAIN USED IN THE COMMON EMITTER CONFIGURATION	15	12	16	0
0 446	03-19 DO YOU MEASURE POWER GAIN USED IN THE COMMON EMITTER CONFIGURATION	15	12	15	0
0 447	03-20 DO YOU CALCULATE THE VOLTAGE GAIN FOR SPECIFIC TRANSISTORS USING A FORMULA THAT IS, DO YOU DIVIDE THE CHANGE	7	5	7	0
0 448	03-21 DO YOU CALCULATE THE CURRENT GAIN FOR SPECIFIC TRANSISTORS USING A FORMULA THAT IS, DO YOU DIVIDE THE	6	5	6	0
0 449	03-22 DO YOU CALCULATE THE POWER GAIN FOR A SPECIFIC TRANSISTOR USING A FORMULA THAT IS, DO YOU MULTIPLY THE	6	4	6	0
0 450	03-23 DO YOU NEED TO KNOW THAT MORE COLLECTOR CURRENT IS GENERATED WITH LESS COLLECTOR VOLTAGE AS TEMPERATURE	8	6	7	0
0 451	03-24 DO YOU COMPUTE THE STATIC OPERATING POINT (WQ) OF A TRANSISTOR AT DIFFERENT TEMPERATURES	5	3	3	0
0 452	03-25 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	14	11	15	20
0 453	03-26 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH SELF-	14	11	16	20

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
G	454	G3-27 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	14	10	16	0
G	455	G3-28 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	14	11	14	0
G	456	G3-29 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	14	11	14	0
G	457	G3-30 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH	11	8	13	0
G	458	G3-31 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM EMITTER (SWAMPING) RESISTOR STABILIZATION	16	12	17	20
G	459	G3-32 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM SELF-BIAS STABILIZATION	16	13	19	20
G	460	G3-33 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM THERMISTOR STABILIZATION	15	12	16	0
G	461	G3-34 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM FORWARD BIAS DIODE STABILIZATION	16	13	18	0
G	462	G3-35 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM REVERSE BIAS DIODE STABILIZATION	16	13	17	0
G	463	G3-36 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM DOUBLE DIODE STABILIZATION	13	10	16	0
G	464	G3-37 DO YOU IDENTIFY AMPLITUDE DISTORTION FOR TRANSISTOR CIRCUITS	18	14	18	20
G	465	G3-38 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF AMPLITUDE DISTORTION	19	16	19	20
G	466	G3-39 DO YOU IDENTIFY FREQUENCY DISTORTION FOR TRANSISTOR CIRCUITS	18	14	18	0
G	467	G3-40 DO YOU IDENTIFY PHASE DISTORTION FOR TRANSISTOR CIRCUITS	14	11	14	0
G	468	G3-41 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF PHASE DISTORTION	13	11	14	0
G	469	G3-42 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF FREQUENCY DISTORTION	16	12	17	0
G	470	G3-43 DO YOU NEED TO KNOW THE DEGENERATIVE EFFECTS ON THE CIRCUIT CAUSED BY CHANGING EMITTER RESISTANCE FOR	9	7	9	0
G	471	G3-44 DO YOU DETERMINE THE CLASS OF OPERATION FOR AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER CIRCUITS	12	11	9	20
G	472	G3-45 DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	16	15	11	20
G	473	G3-46 DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	28	26	24	20
G	474	G3-47 DO YOU TROUBLESHOOT OR REPAIR COMPLEMENTARY SYMMETRY CIRCUITS	18	16	13	0
G	475	G3-48 DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	16	16	11	0

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
G 476	G3-49 DO YOU TROUBLESHOOT OR REPAIR CASCADE-CONNECTED AMPLIFIERS	20	19	16	0	
H 477	H1-01 DO YOU USE OR REFER TO VARACTORS	35	35	22	80	
H 478	H1-02 DO YOU USE OR REFER TO TUNNEL DIODES	26	27	16	0	
H 479	H1-03 DO YOU USE OR REFER TO FIELD EFFECT TRANSISTORS (FET)	24	22	21	0	SOLID-STATE SPECIAL PURPOSE DEVICES
H 480	H1-04 DO YOU USE OR REFER TO UNIJUNCTION TRANSISTORS	23	19	24	20	
H 481	H1-05 DO YOU USE OR REFER TO ZENER DIODES	51	46	45	80	
H 482	H1-06 DO YOU USE OR REFER TO INTEGRATED CIRCUITS	46	39	45	40	
H 483	H2-01 IN YOUR PRESENT JOB, DO YOU WORK WITH POWER SUPPLIES	72	66	77	80	
H 484	H2-02 DO YOU INSPECT POWER SUPPLIES	71	65	78	100	
H 485	H2-03 DO YOU CLEAN POWER SUPPLIES	68	63	75	100	
H 486	H2-04 DO YOU ALIGN OR ADJUST POWER SUPPLIES	73	69	78	100	
H 487	H2-05 DO YOU TROUBLESHOOT TO POWER SUPPLY CIRCUIT LEVEL	66	61	70	100	
H 488	H2-06 DO YOU TROUBLESHOOT TO POWER SUPPLY COMPONENTS	67	62	73	100	
H 489	H2-07 DO YOU REMOVE OR REPLACE COMPLETE POWER SUPPLIES	70	65	76	100	
H 490	H2-08 DO YOU REMOVE OR REPLACE POWER SUPPLY COMPONENTS	68	63	75	100	
H 491	H2-09 DO YOU WORK WITH HALF-WAVE RECTIFIERS	58	54	56	80	
H 492	H2-10 DO YOU WORK WITH FULL-WAVE RECTIFIERS OTHER THAN BRIDGE RECTIFIERS	60	57	60	80	
H 493	H2-11 DO YOU WORK WITH BRIDGE RECTIFIERS	58	56	58	80	
H 494	H2-12 DO YOU WORK WITH THREE-PHASE RECTIFIERS	42	38	40	40	
H 495	H2-13 DO YOU USE OR REFER TO INPUT VOLTAGE	62	57	65	80	
H 496	H2-14 DO YOU USE OR REFER TO INPUT FREQUENCY	51	45	55	60	
H 497	H2-15 DO YOU USE OR REFER TO PEAK OUTPUT VOLTAGE	50	45	50	80	POWER SUPPLIES
H 498	H2-16 DO YOU USE OR REFER TO AVERAGE OUTPUT VOLTAGE	54	49	55	80	
H 499	H2-17 DO YOU USE OR REFER TO RIPPLE AMPLITUDE	49	45	48	80	
H 500	H2-18 DO YOU USE OR REFER TO RIPPLE FREQUENCY	44	41	41	60	
H 501	H2-19 DO YOU USE OR REFER TO PEAK REVERSE (INVERSE) VOLTAGE	30	26	29	60	
H 502	H2-20 DO YOU USE OR REFER TO SHAPE OF OUTPUT WAVEFORMS	54	49	55	80	
H 503	H2-21 DO YOU USE OR REFER TO EFFECTIVE OUTPUT VOLTAGE	54	49	57	80	
H 504	H2-22 DO YOU WORK WITH CIRCUITS WHICH EMPLOY CAPACITIVE FILTERS	48	42	53	60	
H 505	H2-23 DO YOU WORK WITH CIRCUITS WHICH EMPLOY INDUCTIVE FILTERS	45	39	48	40	
H 506	H2-24 DO YOU WORK WITH CIRCUITS WHICH EMPLOY CAPACITIVE INPUT L-TYPE FILTERS	37	33	37	40	
H 507	H2-25 DO YOU WORK WITH CIRCUITS WHICH EMPLOY INDUCTIVE INPUT L-TYPE FILTERS	35	32	35	40	
H 508	H2-26 DO YOU WORK WITH CIRCUITS WHICH EMPLOY LC PI-TYPE FILTERS	34	30	33	40	
H 509	H2-27 DO YOU WORK WITH CIRCUITS WHICH EMPLOY RC PI-TYPE FILTERS	35	31	35	40	
H 510	H2-28 DO YOU WORK WITH CIRCUITS WHICH EMPLOY DON'T REMEMBER WHICH TYPE OF FILTER	30	28	32	80	
H 511	H2-29 DO YOU HAVE THE OPTION OF REPLACING ONE TYPE OF FILTER WITH A DIFFERENT TYPE FILTER	4	4	3	0	
H 512	H3-01 DO YOU WORK WITH OSCILLATORS IN YOUR PRESENT JOB	55	48	63	80	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
H	513	H3-02 DO YOU INSPECT OSCILLATORS	52	46	57	60	
H	514	H3-03 DO YOU ALIGN OR ADJUST OSCILLATORS	51	44	57	80	
H	515	H3-04 DO YOU REMOVE OR REPLACE COMPLETE OSCILLATORS	50	44	59	60	
H	516	H3-05 DO YOU REMOVE OR REPLACE OSCILLATOR COMPONENTS	41	38	47	60	OSCILLATORS
H	517	H3-06 DO YOU TROUBLESHOOT TO OSCILLATOR CIRCUIT LEVEL	47	42	56	60	
H	518	H3-07 DO YOU TROUBLESHOOT TO OSCILLATOR COMPONENTS	41	38	43	60	
H	519	H3-08 DO YOU USE OR REFER TO FEEDBACK	46	39	52	80	
H	520	H3-09 DO YOU USE OR REFER TO FREQUENCY DETERMINING DEVICES (FDD)	39	32	46	60	
H	521	H3-10 DO YOU USE OR REFER TO AMPLITUDE STABILITY	33	28	36	40	
H	522	H3-11 DO YOU USE OR REFER TO FREQUENCY STABILITY	40	35	45	40	
H	523	H3-12 DO YOU USE OR REFER TO DAMPING	31	26	34	60	
H	524	H3-13 DO YOU USE OR REFER TO REGENERATIVE FEEDBACK	41	36	44	60	
H	525	H3-14 DO YOU USE OR REFER TO PIEZOELECTRIC EFFECT	13	11	12	20	
H	526	H3-15 DO YOU USE OR REFER TO CRITICAL DAMPING	16	14	16	40	
H	527	H3-16 DO YOU USE OR REFER TO UNDER DAMPING	19	16	20	40	
H	528	H3-17 DO YOU USE OR REFER TO OVER DAMPING	19	16	20	40	
H	529	H3-18 DO YOU WORK WITH OSCILLATORS WHICH USE LC TANK CIRCUITS AS FDD	36	32	35	40	
H	530	H3-19 DO YOU WORK WITH OSCILLATORS WHICH USE RC NETWORKS AS FDD	35	32	37	40	
H	531	H3-20 DO YOU WORK WITH OSCILLATORS WHICH USE CRYSTALS AS FDD	45	37	53	60	
H	532	H3-21 DO YOU WORK WITH OSCILLATORS WHICH USE DON'T REMEMBER WHICH TYPE OF FDD	16	16	17	20	
H	533	H3-22 DO YOU WORK WITH SERIES HARTLEY SINUSOIDAL OSCILLATORS	15	14	12	20	
H	534	H3-23 DO YOU WORK WITH SHUNT HARTLEY SINUSOIDAL OSCILLATORS	14	14	13	0	
H	535	H3-24 DO YOU WORK WITH COLPITTS SINUSOIDAL OSCILLATORS	13	11	12	0	
H	536	H3-25 DO YOU WORK WITH CLAPP SINUSOIDAL OSCILLATORS	9	8	8	0	
H	537	H3-26 DO YOU WORK WITH BUTLER SINUSOIDAL OSCILLATORS	10	9	8	0	
H	538	H3-27 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF OSCILLATORS	33	28	43	40	
I	539	I1-01 DO YOU WORK WITH MULTIVIBRATORS IN YOUR PRESENT JOB	49	44	52	40	
I	540	I1-02 DO YOU INSPECT WAVE GENERATING OR SHAPING CIRCUITS	43	39	47	40	
I	541	I1-03 DO YOU ALIGN OR ADJUST WAVE GENERATING OR SHAPING CIRCUITS	42	38	48	40	
I	542	I1-04 DO YOU CALIBRATE WAVE GENERATING OR SHAPING CIRCUITS	32	26	39	40	
I	543	I1-05 DO YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUITS	43	38	48	40	
I	544	I1-06 DO YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUIT COMPONENTS	40	38	45	40	MULTIVIBRATORS
I	545	I1-07 DO YOU REMOVE OR REPLACE COMPLETE WAVE GENERATING OR SHAPING CIRCUITS	36	36	40	40	
I	546	I1-08 DO YOU REMOVE OR REPLACE WAVE GENERATING OR SHAPING COMPONENTS	40	38	45	40	
I	547	I1-09 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN LC TANK CIRCUITS	26	24	27	20	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TASK	SPL 001	SPL 004	SPL 005	SPL 006	
I	548	I1-10 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN RC NETWORKS	32	28	34	20	
I	549	I1-11 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN CRYSTALS	28	26	30	20	
I	550	I1-12 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN DON'T REMEMBER WHICH TYPE OF FDO	18	18	16	20	
I	551	I1-13 DO YOU WORK WITH ASTABLE MULTIVIBRATORS	32	29	34	20	
I	552	I1-14 DO YOU WORK WITH MONOSTABLE MULTIVIBRATORS	35	30	38	20	
I	553	I1-15 DO YOU WORK WITH BISTABLE MULTIVIBRATORS	36	32	37	20	
I	554	I1-16 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE MULTIVIBRATORS	16	17	17	20	
I	555	I2-01 DO YOU WORK WITH LIMITERS OR CLAMPERS IN YOUR PRESENT JOB	43	39	46	40	
I	556	I2-02 DO YOU WORK WITH SERIES DIODE LIMITERS	28	24	32	20	
I	557	I2-03 DO YOU WORK WITH SHUNT DIODE LIMITERS	25	22	27	40	
I	558	I2-04 DO YOU WORK WITH LIMITERS WITH BIAS	24	22	26	40	
I	559	I2-05 DO YOU WORK WITH ZENER DIODE LIMITERS	28	25	29	40	LIMITERS AND CLAMPERS
I	560	I2-06 DO YOU WORK WITH TRANSISTOR LIMITERS	20	17	21	40	
I	561	I2-07 DO YOU WORK WITH DON'T KNOW WHICH TYPE OF LIMITERS	16	16	17	20	
I	562	I2-08 DO YOU WORK WITH BASIC DIODE CLAMPING CIRCUITS	28	25	30	40	
I	563	I2-09 DO YOU WORK WITH DIODE CLAMPING CIRCUITS WITH BIAS	25	22	27	40	
I	564	I2-10 DO YOU WORK WITH DON'T KNOW WHICH TYPE OF CLAMPING CIRCUIT	18	19	19	20	
I	565	I3-01 IN YOUR PRESENT JOB, DO YOU WORK ON EQUIPMENT WHICH CONTAINS ELECTRON TUBES	63	64	62	80	
I	566	I3-02 DO YOU CHECK ELECTRON TUBES TO SEE IF THEY ARE GOOD	61	62	61	100	
I	567	I3-03 DO YOU USE TUBE TESTERS TO CHECK ELECTRON TUBES	59	61	56	80	
I	568	I3-04 DO YOU USE MULTIMETERS TO CHECK ELECTRON TUBES	37	36	40	60	
I	569	I3-05 DO YOU USE SCOPES TO CHECK ELECTRON TUBES	45	44	50	80	
I	570	I3-06 DO YOU USE SUBSTITUTION TO CHECK ELECTRON TUBES	56	57	57	100	
I	571	I3-07 DO YOU USE OR REFER TO CUTOFF	36	35	40	80	
I	572	I3-08 DO YOU USE OR REFER TO PEAK INVERSE VOLTAGE RATING	14	13	14	60	
I	573	I3-09 DO YOU USE OR REFER TO PEAK CURRENT RATING	16	16	14	60	
I	574	I3-10 DO YOU USE OR REFER TO TRANSIT TIME	12	11	9	60	
I	575	I3-11 DO YOU USE OR REFER TO PLATE DISSIPATION RATING	12	11	10	80	ELECTRON TUBES
I	576	I3-12 DO YOU USE OR REFER TO SATURATION	36	35	39	80	
I	577	I3-13 DO YOU USE OR REFER TO DC PLATE RESISTANCE	22	23	19	60	
I	578	I3-14 DO YOU COMPUTE ACTUAL VALUES OF THE DC PLATE RESISTANCE FOR ELECTRON TUBES	6	5	5	60	
I	579	I3-15 DO YOU USE OR REFER TO PLATE VOLTAGE	53	53	53	80	
I	580	I3-16 DO YOU USE OR REFER TO PLATE CURRENT	43	45	40	80	
I	581	I3-17 DO YOU USE OR REFER TO GRID VOLTAGE	50	50	52	80	
I	582	I3-18 DO YOU USE OR REFER TO GRID CURRENT	42	43	40	80	
I	583	I3-19 DO YOU USE OR REFER TO CATHODE VOLTAGE	49	49	50	80	
I	584	I3-20 DO YOU USE OR REFER TO CATHODE CURRENT	41	42	39	80	
I	585	I3-21 DO YOU USE OR REFER TO THE TRIODE AMPLIFICATION FACTOR (THE AMPLIFICATION FACTOR FOR TRIODES IS DEFINED AS	12	12	11	40	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
I	586	I3-22 DO YOU CALCULATE ACTUAL VALUES OF TRIODE AMPLIFICATION FACTORS	5	4	4	20
I	587	I3-23 DO YOU USE OR REFER TO MULTIGRID (TETRODE, PENTODE, ETC) AMPLIFICATION FACTORS	6	7	7	60
I	588	I3-24 DO YOU USE OR REFER TO ELECTRON TUBE TRANSCONDUCTANCE (G, WHICH IS MEASURED IN MHOS)	7	7	4	20
I	589	I3-25 DO YOU CALCULATE ACTUAL VALUES OF ELECTRON TUBE TRANSCONDUCTANCES	4	4	4	20
I	590	I3-26 DO YOU USE OR REFER TO THE ELECTRON TUBE PARAMETER CALLED AC PLATE RESISTANCE	8	6	8	40
I	591	I3-27 DO YOU CALCULATE ACTUAL VALUES OF AC PLATE RESISTANCE	5	4	5	40
I	592	I3-28 DO YOU USE OR REFER TO ELECTRON TUBE INTERELECTRODE CAPACITANCE	11	10	10	20
I	593	I3-29 DO YOU USE OR REFER TO CHARACTERISTIC CURVES IN YOUR WORK WITH ELECTRON TUBES	7	6	7	40
I	594	I3-30 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE VOLTAGE FOR A SPECIFIED BIAS	7	7	6	20
I	595	I3-31 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE CURRENT FOR A SPECIFIED BIAS	7	7	6	20
I	596	I3-32 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR CUTOFF	10	9	10	40
I	597	I3-33 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR SATURATION	9	8	9	40
I	598	I3-34 DO YOU USE OR REFER TO ELECTRON TUBE AMPLIFIER GAIN	38	40	32	60
I	599	I3-35 DO YOU USE OR REFER TO ELECTRON TUBE AMPLIFIER EFFICIENCY	23	25	20	40
I	600	I3-36 DO YOU USE TEST TUBE CHECKERS TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	41	45	37	40
I	601	I3-37 DO YOU USE MULTIMETERS TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	23	24	22	60
I	602	I3-38 DO YOU USE OSCILLOSCOPES TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	33	33	34	80
I	603	I3-39 DO YOU USE CHARACTERISTIC CURVES TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	7	8	5	20
I	604	I3-40 DO YOU CALCULATE ANY ELECTRON TUBE CAPACITANCES SUCH AS INPUT CAPACITANCE	4	4	4	0
I	605	I3-41 DO YOU USE OR REFER TO TUBE SOCKET NOTATION	52	53	48	100
I	606	I3-42 DO YOU USE OR REFER TO PIN NUMBERING SYSTEMS	58	59	56	100
I	607	I3-43 DO YOU USE OR REFER TO THE TYPE OF MATERIAL OR THE OPERATING TEMPERATURE OF THE EMITTING SURFACE IN THE	9	7	11	20
I	608	I3-44 DO YOU USE OR REFER TO TUBE SUBSTITUTION MATERIAL SUCH AS MANUALS OR CHARTS	42	46	34	80
J	609	J1-01 DO YOU WORK WITH ELECTRON TUBE AMPLIFIERS OR CIRCUITS IN YOUR PRESENT JOB	51	52	52	80
J	610	J1-02 DO YOU DETERMINE THE CLASS OF OPERATION FOR ELECTRON TUBE AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER	18	18	19	60

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
J	011	J1-03 DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	26	26	26	40	
J	012	J1-04 DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	37	37	40	60	
J	013	J1-05 DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	18	19	15	40	
J	014	J1-06 DO YOU TROUBLESHOOT OR REPAIR CASCADE-CONNECTED AMPLIFIERS	21	20	22	40	
J	015	J1-07 DO YOU TROUBLESHOOT OR REPAIR DON'T KNOW WHICH TYPE OF AMPLIFIER	23	26	22	40	
J	016	J2-01 DO YOU WORK WITH GAS TUBES (HOT CATHODE OR COLD CATHODE)	51	54	50	60	
J	017	J2-02 DO YOU WORK WITH CATHODE-RAY TUBES	60	59	66	100	
J	018	J2-03 DO YOU USE OR REFER TO THE CHARACTERISTICS OF BEAM POWER TUBES	10	8	10	40	
J	019	J2-04 DO YOU TROUBLESHOOT OR REPAIR CIRCUITS IN WHICH BEAM POWER TUBES ARE USED	15	14	14	40	
J	020	J2-05 DO YOU USE OR REFER TO THE CHARACTERISTICS OF THYRATRONS	31	27	38	60	
J	021	J2-06 DO YOU TROUBLESHOOT OR REPAIR CIRCUITS IN WHICH THYRATRONS ARE USED	46	45	52	80	SPECIAL PURPOSE ELECTRON TUBES
J	022	J2-07 DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTRON GUNS OF CATHODE-RAY TUBES (CRT)	39	38	41	60	
J	023	J2-08 DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROMAGNETIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES	45	44	47	60	
J	024	J2-09 DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROSTATIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES	43	43	43	60	
J	025	J2-10 DO YOU USE OR REFER TO PHOSPHOR SCREENS	40	37	46	60	
J	026	J2-11 DO YOU USE OR REFER TO AQUADAG COATINGS	33	31	35	60	
J	027	J2-12 DO YOU USE OR REFER TO ELECTRON OPTICS	16	16	14	40	
J	028	J2-13 DO YOU USE OR REFER TO PERSISTENCE	34	31	37	60	
J	029	J2-14 DO YOU USE OR REFER TO DECAY TIMES	18	15	19	60	
J	030	J2-15 DO YOU USE OR REFER TO FLUORESCENCE	26	24	25	60	
J	031	J2-16 DO YOU USE OR REFER TO PHOSPHORESCENCE	30	26	32	60	
J	032	J3-01 DO YOU WORK ON TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	60	51	70	100	
J	033	J3-02 DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	47	44	47	80	
J	034	J3-03 DO YOU PERFORM TASKS ON FREQUENCY MIXERS	53	47	57	80	HETERODYNING, MODULATION, AND DEMODULATION
J	035	J3-04 DO YOU USE OR REFER TO THE HETERODYNING OF SIGNALS IN YOUR WORK WITH TRANSMIT OR RECEIVE SYSTEMS	43	38	47	40	
J	036	J3-05 DO YOU PERFORM TASKS ON REACTANCE MODULATORS	19	19	14	40	
J	037	J3-06 DO YOU PERFORM TASKS ON MODULATED OSCILLATORS	34	31	37	40	
K	038	K1-01 DO YOU WORK ON AM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	12	11	12	20	
K	039	K1-02 DO YOU INSPECT AM TRANSMIT OR RECEIVE SYSTEMS	11	11	11	20	
K	040	K1-03 DO YOU CLEAN AM TRANSMIT OR RECEIVE SYSTEMS	11	11	10	20	
K	041	K1-04 DO YOU ALIGN OR ADJUST AM TRANSMIT OR RECEIVE SYSTEMS	11	11	11	20	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
K	042	K1-05 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE SYSTEMS	11	11	11	20	
K	043	K1-06 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE COMPONENTS	11	11	11	20	
K	044	K1-07 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE SYSTEMS	11	11	11	20	
K	045	K1-08 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE COMPONENTS	11	11	11	20	AM SYSTEMS
K	046	K1-09 DO YOU PERFORM TASKS ON RF OSCILLATORS	11	11	11	20	
K	047	K1-10 DO YOU PERFORM TASKS ON RF AMPLIFIERS	11	10	11	20	
K	048	K1-11 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	6	6	6	20	
K	049	K1-12 DO YOU PERFORM TASKS ON POWER AMPLIFIERS	10	9	10	20	
K	050	K1-13 DO YOU PERFORM TASKS ON LOCAL OSCILLATORS	11	11	10	20	
K	051	K1-14 DO YOU PERFORM TASKS ON IF AMPLIFIERS	11	11	10	20	
K	052	K1-15 DO YOU PERFORM TASKS ON DETECTORS	11	11	10	20	
K	053	K1-16 DO YOU PERFORM TASKS ON DON'T REMEMBER WHICH AM STAGE	2	1	4	0	
K	054	K1-17 DO YOU USE OR REFER TO AMPLITUDE STABILIZATION IN TRANSMITTERS	7	5	8	20	
K	055	K1-18 DO YOU USE OR REFER TO FREQUENCY STABILIZATION IN TRANSMITTERS	8	7	9	20	
K	056	K1-19 DO YOU USE OR REFER TO SENSITIVITY OF RECEIVERS	10	10	9	20	
K	057	K1-20 DO YOU USE OR REFER TO SELECTIVITY OF RECEIVERS	9	10	6	20	
K	058	K1-21 DO YOU USE OR REFER TO 2ND HARMONIC DISTORTION	5	5	3	20	
K	059	K1-22 DO YOU USE OR REFER TO BANDPASS DISTORTION	5	5	4	20	
K	060	K1-23 DO YOU USE OR REFER TO SQUARE LAW DISTORTION	2	1	1	20	
K	061	K1-24 DO YOU USE OR REFER TO CO-CHANNEL INTERFERENCE	4	3	1	20	
K	062	K1-25 DO YOU USE OR REFER TO IMAGE FREQUENCIES IN RECEIVERS	5	5	3	20	
K	063	K1-26 DO YOU USE OR REFER TO SIGNAL TO IMAGE RATIOS OR IMAGE REJECTION RATIOS	4	4	2	20	
K	064	K1-27 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM TRANSMITTER SCHEMATIC DIAGRAMS	10	9	11	20	
K	065	K1-28 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM RECEIVER SCHEMATIC DIAGRAMS	10	9	9	20	
K	066	K2-01 DO YOU WORK WITH FM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	14	9	22	0	
K	067	K2-02 DO YOU INSPECT FM TRANSMIT OR RECEIVE SYSTEMS	13	10	16	0	
K	068	K2-03 DO YOU CLEAN FM TRANSMIT OR RECEIVE SYSTEMS	12	9	16	0	
K	069	K2-04 DO YOU ALIGN FM TRANSMIT OR RECEIVE SYSTEMS	12	9	15	0	
K	070	K2-05 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE SYSTEMS	12	9	15	0	
K	071	K2-06 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE COMPONENTS	12	9	14	0	
K	072	K2-07 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE SYSTEMS	11	7	14	0	FM SYSTEMS
K	073	K2-08 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE COMPONENTS	11	8	14	0	
K	074	K2-09 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	8	7	6	0	
K	075	K2-10 DO YOU PERFORM TASKS ON FREQUENCY MULTIPLIERS	11	8	11	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
K 676	K2-11 DO YOU PERFORM TASKS ON DRIVERS (INTERMEDIATE AMPLIFIERS)	12	9	12	0	
K 677	K2-12 DO YOU PERFORM TASKS ON POWER AMPLIFIERS	12	9	15	0	
K 678	K2-13 DO YOU PERFORM TASKS ON RF AMPLIFIERS	12	9	14	0	
K 679	K2-14 DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	12	9	12	0	
K 680	K2-15 DO YOU PERFORM TASKS ON IF AMPLIFIERS	12	9	14	0	
K 681	K2-16 DO YOU PERFORM TASKS ON LIMITERS	11	8	13	0	
K 682	K2-17 DO YOU PERFORM TASKS ON FREQUENCY DISCRIMINATORS	12	9	14	0	
K 683	K2-18 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SCHEMATIC DIAGRAMS OF FM TRANSMITTERS	12	9	16	0	
K 684	K2-19 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SCHEMATIC DIAGRAMS OF FM RECEIVERS	13	9	17	0	
K 685	K3-01 DO YOU CONVERT DECIMAL (BASE 10) NUMBERS TO OCTAL (BASE 8) NUMBERS	14	9	14	0	
K 686	K3-02 DO YOU CONVERT DECIMAL NUMBERS TO BINARY (BASE 2) NUMBERS	18	12	18	40	
K 687	K3-03 DO YOU CONVERT OCTAL NUMBERS TO DECIMAL NUMBERS	13	9	11	0	
K 688	K3-04 DO YOU CONVERT OCTAL NUMBERS TO BINARY NUMBERS	12	8	11	0	
K 689	K3-05 DO YOU CONVERT BINARY NUMBERS TO DECIMAL NUMBERS	18	13	16	40	NUMBERING SYSTEMS
K 690	K3-06 DO YOU CONVERT BINARY NUMBERS TO OCTAL NUMBERS	12	8	12	0	
K 691	K3-07 DO YOU ADD BINARY NUMBERS TO GET A SUM	15	12	12	40	
K 692	K3-08 DO YOU SUBTRACT BINARY NUMBERS USING THE END-AROUND-CARRY METHOD	11	8	6	40	
K 693	K3-09 DO YOU SUBTRACT BINARY NUMBERS USING THE DIRECT SUBTRACTION METHOD	13	9	9	40	
K 694	K3-10 DO YOU ADD OCTAL NUMBERS TO GET A SUM	9	6	7	0	
L 695	L1-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS RELATING TO LOGIC FUNCTIONS	22	13	25	20	
L 696	L1-02 DO YOU CONSTRUCT TRUTH TABLES FOR AND LOGIC SYMBOLS OR GATES	12	6	18	20	
L 697	L1-03 DO YOU CONSTRUCT TRUTH TABLES FOR OR LOGIC SYMBOLS OR GATES	12	6	18	20	
L 698	L1-04 DO YOU CONSTRUCT TRUTH TABLES FOR AND OR OR LOGIC SYMBOLS WITH STATE INDICATORS	12	6	19	20	
L 699	L1-05 DO YOU CONSTRUCT TRUTH TABLES FOR EXCLUSIVE OR LOGIC SYMBOLS OR GATES	12	5	19	20	
L 700	L1-06 DO YOU USE OR REFER TO TRUTH TABLES FOR AND LOGIC SYMBOLS OR GATES	16	9	19	20	LOGIC FUNCTIONS
L 701	K1-07 DO YOU USE OR REFER TO TRUTH TABLES FOR OR LOGIC SYMBOLS OR GATES	16	9	19	20	
L 702	K1-08 DO YOU USE OR REFER TO TRUTH TABLES FOR AND OR OR LOGIC SYMBOLS WITH STATE INDICATORS	16	8	20	20	
L 703	L1-09 DO YOU USE OR REFER TO TRUTH TABLES FOR EXCLUSIVE OR LOGIC SYMBOLS	16	9	20	0	
L 704	L1-10 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR AND GATES	21	12	23	20	
L 705	L1-11 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR OR GATES	21	12	24	20	
L 706	L1-12 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR NAND OR NOR GATES	21	12	24	20	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
L 707	L1-13 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR EXCLUSIVE OR GATES	20	11	24	20
L 708	L2-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS RELATING TO BOOLEAN EQUATIONS, LOGIC DIAGRAMS, OR LOGIC	11	6	17	20
L 709	L2-02 DO YOU DRAW LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUITS	5	2	7	0
L 710	L2-03 DO YOU CONSTRUCT TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	3	2	3	0
L 711	L2-04 DO YOU DRAW LOGIC DIAGRAMS FROM GIVEN BOOLEAN EQUATIONS	4	2	6	0
L 712	L2-05 DO YOU MEASURE INPUTS OR OUTPUTS OF LOGIC GATES	11	6	16	20
L 713	L2-06 DO YOU DEVELOP OR ANALYZE BOOLEAN EQUATIONS IN THE PROCESS OF TROUBLESHOOTING DIGITAL CIRCUITS	5	3	7	0
L 714	L2-07 DO YOU ANALYZE LOGIC CIRCUITS BY USING BOOLEAN ALGEBRA	5	3	6	0
L 715	L2-08 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUIT GATES	8	4	11	20
L 716	L2-09 DO YOU USE OR REFER TO TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	5	3	6	0
L 717	L2-10 DO YOU USE OR REFER TO LOGIC DIAGRAMS CONSISTING OF MORE THAN ONE GATE	11	5	17	20
L 718	L2-11 DO YOU COMPUTE SUM AND CARRY EXPRESSIONS FOR SERIAL HALF OR FULL ADDER LOGIC DIAGRAMS	5	3	8	0
L 719	L2-12 DO YOU TRACE DATA FLOW THROUGH PARALLEL FULL ADDER LOGIC DIAGRAMS	7	3	11	0
L 720	L2-13 DO YOU WORK WITH ASTABLE (FREE RUNNING) MULTIVIBRATORS	11	7	16	20
L 721	L2-14 DO YOU WORK WITH BISTABLE (FLIP-FLOP) MULTIVIBRATORS	12	8	17	20
L 722	L2-15 DO YOU WORK WITH MONOSTABLE (ONE-SHOT) MULTIVIBRATORS	12	7	17	20
L 723	L2-16 DO YOU USE OR REFER TO FLIP-FLOP MULTIVIBRATOR SYMBOLS	12	7	17	20
L 724	L2-17 DO YOU USE OR REFER TO SINGLE-SHOT MULTIVIBRATOR SYMBOLS	12	7	17	20
L 725	L2-18 DO YOU USE OR REFER TO FLIP-FLOP CIRCUIT DIAGRAMS	12	8	17	20
L 726	L2-19 DO YOU USE OR REFER TO FLIP-FLOP TRUTH TABLES	10	6	14	20
L 727	L2-20 DO YOU USE OR REFER TO COMPLEMENTED FLIP-FLOP LOGIC SYMBOLS	10	5	14	20
L 728	L2-21 DO YOU USE OR REFER TO COMPLEMENTING FLIP-FLOP LOGIC SYMBOLS	10	6	14	20
L 729	L2-22 DO YOU MEASURE OUTPUT WAVESHAPES OF LOGIC CIRCUITS	11	6	15	20
L 730	L2-23 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTED FLIP-FLOP SCHEMATIC DIAGRAMS	10	5	14	20
L 731	L2-24 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTING FLIP-FLOP SCHEMATIC DIAGRAMS	10	5	14	20
L 732	L2-25 DO YOU CONSTRUCT TRUTH TABLES FOR J-K FLIP-FLOP LOGIC SYMBOLS	6	3	10	0

BOOLEAN EQUATIONS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
L 733	L3-01	DO YOU WORK WITH DIGITAL COUNTERS IN YOUR PRESENT JOB	25	18	26	40	
L 734	L3-02	DO YOU USE OR REFER TO UP-COUNTERS	23	16	25	40	
L 735	L3-03	DO YOU USE OR REFER TO DOWN-COUNTERS	20	15	24	20	
L 736	L3-04	DO YOU USE OR REFER TO SERIAL COUNTERS	21	15	23	20	
L 737	L3-05	DO YOU USE OR REFER TO PARALLEL COUNTERS	17	10	20	20	
L 738	L3-06	DO YOU USE OR REFER TO RING COUNTERS	11	6	11	40	
L 739	L3-07	DO YOU USE OR REFER TO DECADE COUNTERS	21	14	26	40	
L 740	L3-08	DO YOU USE OR REFER TO COUNT DETECT CIRCUITS	17	11	18	40	
L 741	L3-09	DO YOU USE OR REFER TO DOWN CLOCKS	22	15	25	40	
L 742	L3-10	DO YOU USE OR REFER TO UP CLOCKS	22	16	25	40	
L 743	L3-11	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	16	11	19	40	
L 744	L3-12	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTING FLIP-	16	11	20	20	
L 745	L3-13	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF DECADE COUNTERS	16	11	25	40	COUNTERS
L 746	L3-14	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF RING COUNTERS	10	5	11	40	
L 747	L3-15	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE REGISTER	15	8	19	40	
L 748	L3-16	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	17	9	24	40	
L 749	L3-17	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF COUNTERS	12	7	15	0	
L 750	L3-18	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	11	6	16	0	
L 751	L3-19	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENT-	12	6	16	0	
L 752	L3-20	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE	11	6	16	0	
L 753	L3-21	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR OTHER TYPES OF COUNTERS	10	5	13	20	
L 754	L3-22	DO YOU CONSTRUCT TRUTH TABLES FROM LOGIC DIAGRAMS OF DECADE COUNTERS	8	4	14	0	
L 755	L3-23	DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP IN RING COUNTERS FOR SPECIFIC INPUT PULSES	10	5	9	20	
L 756	L3-24	DO YOU DETERMINE THE APPROPRIATE AND GATE NECESSARY IN COUNT DETECT CIRCUITS TO INDICATE A REQUIRED COUNT	12	5	16	0	
H 757	H1-01	DO YOU WORK WITH SAWTOOTH WAVE GENERATORS	56	51	63	60	
H 758	H1-02	DO YOU WORK WITH TRAPEZOIDAL WAVE GENERATORS	36	32	41	60	
H 759	H1-03	DO YOU WORK WITH PULSED OSCILLATORS WITH REGENERATIVE FEEDBACK	34	29	42	40	
H 760	H1-04	DO YOU WORK WITH PULSED OSCILLATORS WITHOUT REGENERATIVE FEEDBACK	30	28	31	40	TIMING CIRCUITS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
M 761	M1-05	DO YOU WORK WITH BLOCKING OSCILLATORS	52	49	59	100	
M 762	M1-06	DO YOU USE OR REFER TO RISE TIME	44	40	50	60	
M 763	M1-07	DO YOU USE OR REFER TO FALL OR FLYBACK TIME	43	39	48	60	
M 764	M1-08	DO YOU USE OR REFER TO SWEEP TIME	51	46	61	80	
M 765	M1-09	DO YOU USE OR REFER TO ELECTRICAL LENGTH OF SAWTOOTH WAVEFORMS	47	44	55	80	
M 766	M1-10	DO YOU USE OR REFER TO PHYSICAL LENGTH OF SAWTOOTH WAVEFORMS	44	41	52	80	
M 767	M1-11	DO YOU USE OR REFER TO LINEAR SLOPE OF SAWTOOTH WAVEFORMS	43	40	45	80	
M 768	M1-12	DO YOU USE OR REFER TO GATE LENGTH OF SAWTOOTH WAVEFORMS	45	43	48	80	
M 769	M2-01	DO YOU USE SIGNAL GENERATORS IN YOUR PRESENT JOB	50	46	53	40	
M 770	M2-02	DO YOU PERFORM OPERATIONAL CHECKS WHILE USING SIGNAL GENERATORS	49	46	50	40	
M 771	M2-03	DO YOU PERFORM PERIODIC MAINTENANCE SUCH AS ADJUSTING, ALIGNING, OR CALIBRATING WHILE USING SIGNAL	42	40	44	40	
M 772	M2-04	DO YOU TROUBLESHOOT TO AN ASSEMBLY OR SUBASSEMBLY WHILE USING SIGNAL GENERATORS	35	35	35	20	USE OF SIGNAL GENERATORS
M 773	M2-05	DO YOU TROUBLESHOOT TO THE SMALLEST REPLACEABLE COMPONENT WHILE USING SIGNAL GENERATORS	25	25	26	0	
M 774	M2-06	DO YOU USE AUDIO SINE-WAVE GENERATORS	19	19	13	0	
M 775	M2-07	DO YOU USE AUDIO NON-SINUSOIDAL WAVE GENERATORS SUCH AS SQUARE WAVE, TRIANGLE, PULSE, OR SPIKE	17	16	12	0	
M 776	M2-08	DO YOU USE RF GENERATORS LESS THAN 1,000 MH	21	18	20	0	
M 777	M2-09	DO YOU USE RF GENERATORS GREATER THAN 1,000 MH	41	38	42	20	
M 778	M2-10	DO YOU USE OTHER SPECIAL PURPOSE OR MULTI-FUNCTION GENERATORS	26	24	25	0	
M 779	M3-01	IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH ALTERNATING CURRENT OR DIRECT CURRENT MOTORS OR	59	54	62	80	
M 780	M3-02	DO YOU INSPECT MOTORS	58	54	59	80	
M 781	M3-03	DO YOU CLEAN OR LUBRICATE MOTORS	56	53	58	80	
M 782	M3-04	DO YOU OPERATE MOTORS	55	49	61	60	
M 783	M3-05	DO YOU REMOVE OR REPLACE COMPLETE MOTORS	53	50	59	80	
M 784	M3-06	DO YOU REMOVE OR REPLACE MOTOR PARTS	39	40	35	80	
M 785	M3-07	DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS OF MOTORS	54	50	60	60	
M 786	M3-08	DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF MOTORS	31	31	30	20	MOTORS AND GENERATORS
M 787	M3-09	DO YOU PERFORM ANY TASKS ON FIELD COILS	17	16	19	0	
M 788	M3-10	DO YOU PERFORM ANY TASKS ON ARMATURES	22	21	22	0	
M 789	M3-11	DO YOU PERFORM ANY TASKS ON MOTORS	23	22	24	20	
M 790	M3-12	DO YOU PERFORM ANY TASKS ON BRUSHES	44	46	35	20	
M 791	M3-13	DO YOU PERFORM ANY TASKS ON SLIP RINGS	33	35	31	20	
M 792	M3-14	DO YOU PERFORM ANY TASKS ON COMMUTATORS	28	29	25	0	
M 793	M3-15	DO YOU PERFORM ANY TASKS ON POLE PIECES	15	15	14	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
M 794	M3-16 DO YOU DETERMINE OR MEASURE THE MAGNITUDE OF THE FORCE OR TORQUE CREATED BY A MOTOR	7	7	6	20	
M 795	M3-17 DO YOU DETERMINE OR MEASURE THE DIRECTION OF THE MECHANICAL FORCE OR TORQUE CREATED BY A MOTOR	12	11	11	20	
M 796	M3-18 DO YOU DETERMINE OR MEASURE THE MAGNITUDE OR DIRECTION OF THE INDUCED VOLTAGE IN MOTORS	12	9	13	20	
M 797	M3-19 DO YOU WORK WITH SYNCHRONOUS MOTORS	35	34	34	40	
M 798	M3-20 DO YOU WORK WITH INDUCTION MOTORS	30	30	29	20	
M 799	M3-21 DO YOU WORK WITH SPLIT-PHASE MOTORS	27	26	27	0	
M 800	M3-22 DO YOU WORK WITH SOME COMBINATION OF THE ABOVE MOTORS	38	34	42	60	
M 801	M3-23 DO YOU INSPECT GENERATORS	46	45	52	60	
M 802	M3-24 DO YOU CLEAN OR LUBRICATE GENERATORS	43	43	44	60	
M 803	M3-25 DO YOU OPERATE GENERATORS	45	39	53	40	
M 804	M3-26 DO YOU REMOVE OR REPLACE COMPLETE GENERATORS	32	32	33	60	
M 805	M3-27 DO YOU REMOVE OR REPLACE GENERATOR PARTS	26	30	16	40	
M 806	M3-28 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS OF GENERATORS	37	37	32	60	
M 807	M3-29 DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF GENERATORS	22	26	15	0	
N 808	N1-01 DO YOU WORK WITH METERS IN YOUR PRESENT JOB	67	62	76	60	
N 809	N1-02 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF PERMANENT MAGNETS	22	21	25	40	
N 810	N1-03 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF MOVING COILS	25	22	29	20	
N 811	N1-04 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF SPIRAL SPRINGS	21	17	25	20	METER MOVEMENTS
N 812	N1-05 DO YOU READ METER SCALES	69	64	79	60	
N 813	N1-06 DO YOU EXTEND THE RANGE OF AMMETERS	33	32	34	20	
N 814	N1-07 DO YOU ZERO OHMMETERS	66	59	75	60	
N 815	N1-08 DO YOU ZERO AMMETERS	41	38	42	20	
N 816	N1-09 DO YOU EXTEND THE RANGE OF VOLTMETERS	43	43	44	20	
N 817	N1-10 DO YOU USE OR REFER TO VOLTMETER SENSITIVITY (EXPRESSED IN UNITS OF OHMS PER VOLT)	45	41	48	20	
N 818	N2-01 DO YOU WORK WITH SATURABLE REACTORS OR MAGNETIC AMPLIFIERS IN YOUR PRESENT JOB	15	19	6	40	
N 819	N2-02 DO YOU INSPECT MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	14	19	5	40	
N 820	N2-03 DO YOU CLEAN MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	13	18	5	40	
N 821	N2-04 DO YOU ADJUST MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	13	18	4	40	
N 822	N2-05 DO YOU TROUBLESHOOT MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	13	16	5	40	
N 823	N2-06 DO YOU REMOVE OR REPLACE MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	13	17	5	40	
N 824	N2-07 DO YOU REMOVE OR REPLACE MAGNETIC AMPLIFIER OR SATURABLE REACTOR COMPONENTS	10	13	4	20	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
N 825	N2-08	DO YOU USE OR REFER TO HYSTERESIS CURVES OR LOOPS	3	2	2	40	SATURABLE REACTORS AND MAGNETIC AMPLIFIERS
N 826	N2-09	DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT WAVEFORMS ACROSS REACTOR WINDINGS OR LOAD RESISTORS OF	5	5	2	20	
N 827	N2-10	DO YOU MEASURE OUTPUT WAVEFORMS ACROSS REACTOR WINDINGS OR LOAD RESISTORS OF SINGLE WINDING SATURABLE	5	6	3	20	
N 828	N2-11	DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT WAVEFORMS FOR MAGNETIC AMPLIFIERS	6	6	2	40	
N 829	N2-12	DO YOU USE OR REFER TO COERCIVE FORCE IN SATURABLE REACTORS	2	1	2	20	
N 830	N2-13	DO YOU USE OR REFER TO RESIDUAL MAGNETISM IN SATURABLE REACTORS	3	2	2	20	
N 831	N2-14	DO YOU USE OR REFER TO FLUX DENSITY IN SATURABLE REACTORS	2	2	2	20	
N 832	N2-15	DO YOU USE OR REFER TO POINT OF SATURATION IN SATURABLE REACTORS	4	3	4	20	
N 833	N2-16	DO YOU USE OR REFER TO SATURABLE REACTOR SCHEMATIC SYMBOLS	8	10	4	20	
N 834	N3-01	DO YOU WORK WITH WAVESHAPING CIRCUITS IN YOUR PRESENT JOB	54	47	69	60	
N 835	N3-02	DO YOU USE OR REFER TO TRANSIENT INTERVALS	24	21	32	40	
N 836	N3-03	DO YOU USE OR REFER TO PULSE WIDTH (PW)	54	47	67	60	
N 837	N3-04	DO YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	52	46	66	60	
N 838	N3-05	DO YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY (PRF)	53	47	68	60	WAVESHAPING CIRCUITS
N 839	N3-06	DO YOU USE OR REFER TO DIFFERENTIATING CIRCUITS	46	41	53	40	
N 840	N3-07	DO YOU USE OR REFER TO INTEGRATING CIRCUITS	44	39	52	60	
N 841	N3-08	DO YOU USE OR REFER TO THE CLASSIFICATION OF TIME CONSTANTS (TC) AS LONG, MEDIUM, OR SHORT	29	26	34	60	
N 842	N3-09	DO YOU DETERMINE WHETHER AN LR OR RC CIRCUIT IS DIFFERENTIATING OR INTEGRATING BASED ON THE TIME CONSTANT	22	18	28	60	
N 843	N3-10	DO YOU WORK WITH SQUARE WAVE GENERATORS	30	26	32	40	
N 844	N3-11	DO YOU WORK WITH RECTANGULAR WAVE GENERATORS	23	20	24	40	
O 845	O1-01	DO YOU WORK ON SINGLE SIDEBAND SYSTEMS IN YOUR PRESENT JOB	2	2	2	0	
O 846	O1-02	DO YOU INSPECT SSB TRANSMIT OR RECEIVE SYSTEMS	1	1	0	0	
O 847	O1-03	DO YOU CLEAN SSB TRANSMIT OR RECEIVE SYSTEMS	1	1	0	0	
O 848	O1-04	DO YOU ALIGN SSB TRANSMIT OR RECEIVE SYSTEMS	0	1	0	0	
O 849	O1-05	DO YOU TROUBLESHOOT TO SSB TRANSMIT OR RECEIVE SYSTEMS	1	1	0	0	SINGLE SIDEBAND SYSTEMS
O 850	O1-06	DO YOU TROUBLESHOOT TO SSB TRANSMIT OR RECEIVE COMPONENTS	1	1	0	0	
O 851	O1-07	DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE SYSTEMS	1	1	0	0	
O 852	O1-08	DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE COMPONENTS	1	1	0	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
0	853	01-09 DO YOU PERFORM TASKS ON SSB AUDIO AMPLIFIERS	1	1	0	0	
0	854	01-10 DO YOU PERFORM TASKS ON SSB BALANCED MODULATORS	1	1	0	0	
0	855	01-11 DO YOU PERFORM TASKS ON SSB CARRIER OSCILLATORS	1	1	1	0	
0	856	01-12 DO YOU PERFORM TASKS ON SSB LC FILTERS	1	1	1	0	
0	857	01-13 DO YOU PERFORM TASKS ON SSB CRYSTAL FILTERS	1	1	1	0	
0	858	01-14 DO YOU PERFORM TASKS ON SSB MECHANICAL FILTERS	1	0	1	0	
0	859	01-15 DO YOU PERFORM TASKS ON SSB OSCILLATORS	1	1	1	0	
0	860	01-16 DO YOU PERFORM TASKS ON SSB MIXERS	1	1	1	0	
0	861	01-17 DO YOU PERFORM TASKS ON SSB DRIVERS	1	1	1	0	
0	862	01-18 DO YOU PERFORM TASKS ON SSB POWER AMPLIFIERS	1	1	1	0	
0	863	01-19 DO YOU PERFORM TASKS ON SSB RF AMPLIFIERS	1	1	1	0	
0	864	01-20 DO YOU PERFORM TASKS ON SSB FREQUENCY CONVERTERS	1	1	1	0	
0	865	01-21 DO YOU PERFORM TASKS ON SSB IF AMPLIFIERS	1	1	1	0	
0	866	01-22 DO YOU PERFORM TASKS ON SSB DEMODULATORS	1	1	1	0	
0	867	01-23 DO YOU PERFORM TASKS ON SSB DON'T REMEMBER WHICH SSB SYSTEM STAGES	1	1	1	0	
0	868	01-24 DO YOU USE OR REFER TO SELECTIVE FADING	0	0	1	0	
0	869	01-25 DO YOU USE OR REFER TO PEAK POWER	1	1	1	0	
0	870	01-26 DO YOU USE OR REFER TO FREQUENCY STABILITY	1	1	1	0	
0	871	01-27 DO YOU USE OR REFER TO RESPONSE CURVES FOR BANDWIDTH FILTERS	0	0	1	0	
0	872	01-28 DO YOU CALCULATE PEAK POWER OR EFFECTIVE POWER OF SSB TRANSMITTERS	0	0	1	0	
0	873	01-29 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB TRANSMITTER SCHEMATIC DIAGRAMS	1	1	1	0	
0	874	01-30 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB RECEIVER SCHEMATIC DIAGRAMS	1	1	1	0	
0	875	02-01 DO YOU WORK ON PULSE MODULATION SYSTEMS IN YOUR PRESENT JOB	39	36	50	0	
0	876	02-02 DO YOU INSPECT PULSE MODULATION SYSTEMS	37	35	48	0	
0	877	02-03 DO YOU CLEAN PULSE MODULATION SYSTEMS	35	34	45	0	
0	878	02-04 DO YOU ALIGN PULSE MODULATION SYSTEMS	34	33	45	0	
0	879	02-05 DO YOU TROUBLESHOOT TO PULSE MODULATION SYSTEMS	36	33	49	0	
0	880	02-06 DO YOU TROUBLESHOOT TO PULSE MODULATION SYSTEM COMPONENTS	35	33	45	0	
0	881	02-07 DO YOU REMOVE OR REPLACE PULSE MODULATION SYSTEMS	34	33	47	0	
0	882	02-08 DO YOU REMOVE OR REPLACE PULSE MODULATION SYSTEM COMPONENTS	35	34	48	0	
0	883	02-09 DO YOU WORK ON PULSE-AMPLITUDE MODULATION (PAM) SYSTEMS	19	19	20	0	
0	884	02-10 DO YOU WORK ON PULSE-DURATION MODULATION (PDM) SYSTEMS	15	14	19	0	PULSE MODULATION SYSTEMS
0	885	02-11 DO YOU WORK ON PULSE-POSITION MODULATION (PPM) SYSTEMS	10	9	12	0	
0	886	02-12 DO YOU WORK ON PULSE-CODE MODULATION (PCM) SYSTEMS	9	9	7	0	
0	887	02-13 DO YOU WORK ON LINE PULSING MODULATION SYSTEMS	7	8	6	0	
0	888	02-14 DO YOU WORK ON DON'T REMEMBER WHICH TYPE OF MODULATION SYSTEM	15	16	16	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
0 889	02-15 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM POWER SUPPLIES	36	34	47	0
0 890	02-16 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM CHANGING CHOKES AND CHARGING DIODES	30	28	43	0
0 891	02-17 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM PULSE FORMING NETWORKS	35	34	47	0
0 892	02-18 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM TIMERS	25	26	31	0
0 893	02-19 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM SWITCHES SUCH AS GAS THYRATRONS	27	25	39	0
0 894	02-20 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM PULSE TRANSFORMERS	34	33	47	0
0 895	02-21 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM TRANSMITTER TUBES	34	33	45	0
0 896	02-22 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM RF AMPLIFIERS	32	31	42	0
0 897	02-23 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM FREQUENCY CONVERTERS	28	29	35	0
0 898	02-24 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM IF AMPLIFIERS	36	34	48	0
0 899	02-25 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM DETECTORS	34	33	45	0
0 900	02-26 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM VIDEO AMPLIFIERS	35	33	47	0
0 901	02-27 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM POWER VIDEO AMPLIFIERS	27	26	37	0
0 902	02-28 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM DON'T REMEMBER WHICH PULSE MODULATION SYSTEM STAGES	7	7	10	0
0 903	02-29 DO YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY (PRF)	39	36	52	0
0 904	02-30 DO YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	37	35	49	0
0 905	02-31 DO YOU USE OR REFER TO PULSE WIDTH (PW)	38	35	50	0
0 906	02-32 DO YOU USE OR REFER TO PULSE SHAPE	37	34	48	0
0 907	02-33 DO YOU USE OR REFER TO PEAK POWER	35	32	46	0
0 908	02-34 DO YOU USE OR REFER TO AVERAGE POWER	35	33	45	0
0 909	02-35 DO YOU CALCULATE PULSE RECURRENCE TIME (PRT) OR PULSE RECURRENCE FREQUENCY (PRF)	27	24	41	0
0 910	02-36 DO YOU MEASURE PULSE RECURRENCE TIME (PRT) OR PULSE RECURRENCE FREQUENCY (PRF)	34	29	49	0
0 911	02-37 DO YOU USE FORMULAS TO CALCULATE AVERAGE POWER OR PEAK POWER OF PULSE MODULATION TRANSMIT SYSTEMS	23	19	35	0
0 912	02-38 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH PULSE MODULATION TRANSMITTER SCHEMATIC DIAGRAMS	35	32	49	0
0 913	02-39 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH PULSE MODULATION RECEIVER SCHEMATIC DIAGRAMS	36	34	47	0
0 914	03-01 DO YOU WORK WITH ANTENNAS IN YOUR PRESENT JOB	64	56	76	100
0 915	03-02 DO YOU INSPECT ANTENNAS	63	54	75	100

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
0 916	03-03 DO YOU CLEAN ANTENNAS	58	51	66	100
0 917	03-04 DO YOU PHYSICALLY ALIGN ANTENNAS	55	49	70	40
0 918	03-05 DO YOU ELECTRICALLY ALIGN ANTENNAS	55	50	66	60
0 919	03-06 DO YOU TROUBLESHOOT TO ANTENNAS	53	46	63	40
0 920	03-07 DO YOU TROUBLESHOOT TO ANTENNA COMPONENTS	51	44	61	60
0 921	03-08 DO YOU REMOVE OR INSTALL ANTENNAS	47	39	70	20
0 922	03-09 DO YOU REMOVE OR REPLACE COMPONENTS OF ANTENNAS	54	48	61	60
0 923	03-10 DO YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF E OR ELECTRIC FIELD LINES	10	8	10	0
0 924	03-11 DO YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF H OR MAGNETIC FIELD LINES	9	8	6	0
0 925	03-12 DO YOU DETERMINE THE DIRECTION OF THE MAGNETIC LINES IN RELATION TO THE ELECTRIC LINES OF FORCE FOR ANTENNAS	7	5	4	0
0 926	03-13 DO YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE OF CORRECT LENGTH (HALF-WAVE) ACT AS	6	5	5	0
0 927	03-14 DO YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE LONGER THAN A HALF-WAVE ACT AS INDUCTIVE LOADS	6	6	4	20
0 928	03-15 DO YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE SHORTER THAN A HALF-WAVE ACT AS CAPACITIVE LOADS	6	5	3	20
0 929	03-16 DO YOU WORK WITH HERTZ ANTENNAS	9	8	7	20
0 930	03-17 DO YOU WORK WITH MARCONI ANTENNAS	3	3	2	0
0 931	03-18 DO YOU WORK WITH BROADSIDE ARRAYS	5	6	4	0
0 932	03-19 DO YOU WORK WITH END-FIRE ARRAYS	9	9	9	20
0 933	03-20 DO YOU WORK WITH CARDIOID ARRAYS	4	4	4	0
0 934	03-21 DO YOU WORK WITH COLLINEAR ARRAYS	5	5	6	0
0 935	03-22 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC INDUCTION FIELDS WHEN WORKING WITH ANTENNAS	5	4	3	60
0 936	03-23 DO YOU MEASURE ELECTROMAGNETIC INDUCTION FIELDS OF ANTENNAS	4	3	1	40
0 937	03-24 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC RADIATION FIELDS WHEN WORKING WITH ANTENNAS	10	8	10	40
0 938	03-25 DO YOU MEASURE ELECTROMAGNETIC RADIATION FIELDS OF ANTENNAS	6	5	6	20
0 939	03-26 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA RADIATION	5	4	4	20
0 940	03-27 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA INDUCTION FIELD	4	3	3	20
0 941	03-28 ARE ANY OF THE ANTENNAS YOU WORK ON LINEARLY POLARIZED	23	21	24	40
0 942	03-29 ARE ANY OF THE ANTENNAS YOU WORK ON CIRCULARLY POLARIZED	32	29	34	60
0 943	03-30 DO YOU MEASURE OR DETERMINE THE POLARITY OF ANTENNAS YOU WORK ON	16	15	14	20
0 944	03-31 DO YOU CONSTRUCT, OR MAKE THE CALCULATIONS NECESSARY TO CONSTRUCT, ANTENNAS OF CORRECT LENGTH FOR	2	1	1	20

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
O	945	03-32 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS	9	8	7	20
O	946	03-33 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS DIRECTORS	8	7	6	20
O	947	03-34 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS REFLECTORS	13	10	14	20
O	948	03-35 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN DON'T REMEMBER WHAT KIND OF ELEMENTS	26	23	28	20
O	949	03-36 DO YOU WORK ON UNIDIRECTIONAL ANTENNAS	31	27	38	60
O	950	03-37 DO YOU WORK ON BIDIRECTIONAL ANTENNAS	10	8	10	0
O	951	03-38 DO YOU WORK ON DON'T REMEMBER THE DIRECTIONALITY	18	16	16	40
O	952	03-39 DO YOU WORK WITH ROTAR ANTENNA ARRAYS	20	18	19	40
P	953	P1-01 IN YOUR PRESENT JOB DO YOU WORK WITH TRANSMISSION LINES (TRANSMISSION LINES ARE DEFINED TO INCLUDE LEADS	30	25	35	20
P	954	P1-02 DO YOU REFER TO OR USE COPPER LOSS OR I2R LOSS IN TRANSMISSION LINES	3	2	2	0
P	955	P1-03 DO YOU REFER TO OR USE SKIN EFFECTS OF HIGH FREQUENCY CURRENTS IN TRANSMISSION LINES	6	4	5	0
P	956	P1-04 DO YOU REFER TO OR USE RADIATION LOSS IN TRANSMISSION LINES	8	6	5	0
P	957	P1-05 DO YOU USE OR REFER TO DIELECTRIC LOSS IN TRANSMISSION LINES	4	2	2	0
P	958	P1-06 DO YOU USE OR REFER TO LEAKAGE LOSSES IN TRANSMISSION LINES	7	5	5	0
P	959	P1-07 DO YOU WORK WITH TWISTED PAIR TRANSMISSION LINES	11	9	11	0
P	960	P1-08 DO YOU WORK WITH TWIN LEAD TRANSMISSION LINES	10	9	11	0
P	961	P1-09 DO YOU WORK WITH OPEN TWO-WIRE TRANSMISSION LINES	7	7	5	0
P	962	P1-10 DO YOU WORK WITH FLEXIBLE COAXIAL CABLE TRANSMISSION LINES	28	23	35	20
P	963	P1-11 DO YOU WORK WITH RIGID COAXIAL CABLE TRANSMISSION LINES	21	18	24	20
P	964	P1-12 DO YOU TROUBLESHOOT TRANSMISSION LINES	24	20	29	20
P	965	P1-13 DO YOU ANALYZE VOLTAGE OR CURRENT WAVEFORMS IN TRANSMISSION LINES TO DETERMINE THE TYPE OF TERMINATION	5	4	4	0
P	966	P1-14 DO YOU SELECT APPROPRIATE TRANSMISSION LINES TERMINATIONS TO ACHIEVE DESIRED WAVEFORMS	5	4	4	0
P	967	P1-15 DO YOU USE OR REFER TO SCHEMATIC SYMBOLS FOR LINE TERMINATIONS IN TERMS OF CIRCUIT TERMINATIONS	11	9	12	0
P	968	P1-16 DO YOU MEASURE STANDING WAVE RATIOS (SR) OF TRANSMISSION LINES	14	11	12	20
P	969	P1-17 DO YOU CALCULATE STANDING WAVE RATIOS (SWR) OF TRANSMISSION LINES	8	6	6	20
P	970	P1-18 DO YOU PERFORM THE CALCULATIONS NECESSARY TO DETERMINE THE IMPEDANCE AND LENGTH OF QUARTER - WAVELENGTH	3	3	1	0

TRANSMISSION LINES

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
P 971	P1-19 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING MATCHING TRANSFORMERS	10	9	11	0
P 972	P1-20 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING DELTA MATCHING	6	5	7	20
P 973	P1-21 DO YOU SELECT THE TYPE OF TRANSMISSION LINE NEEDED FOR PARTICULAR JOBS WITHOUT REFERRING TO TECHNICAL DATA	3	2	4	0
P 974	P1-22 DO YOU USE OR REFER TO THE TERM CHARACTERISTIC IMPEDANCE (Z0) OF TRANSMISSION LINES	7	6	4	20
P 975	P1-23 DO YOU CALCULATE THE CHARACTERISTIC IMPEDANCE (Z0) OF TRANSMISSION LINES	2	2	0	0
P 976	P1-24 DO YOU USE OR REFER TO THE TERM CUTOFF FREQUENCY OF TRANSMISSION LINES	3	3	1	0
P 977	P1-25 DO YOU USE OR REFER TO THE TERM VELOCITY FACTOR (K) OF TRANSMISSION LINES	2	1	1	0
P 978	P1-26 DO YOU COMPUTE THE ELECTRICAL LENGTH OF TRANSMISSION LINES FOR PARTICULAR FREQUENCIES	3	3	1	0
P 979	P1-27 DO YOU CONSTRUCT TRANSMISSION LINES OF PARTICULAR ELECTRICAL LENGTH FOR GIVEN FREQUENCIES	4	3	1	0
P 980	P1-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT AS THE FREQUENCY INCREASES AND THE PHYSICAL LENGTH OF	3	3	2	0
P 981	P1-29 DO YOU WORK WITH NONRESONANT (FLAT) TRANSMISSION LINES	6	4	6	0
P 982	P1-30 DO YOU WORK WITH RESONANT TRANSMISSION LINES	8	6	8	20
P 983	P1-31 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING STUB MATCHING	5	5	3	0
P 984	P2-01 DO YOU WORK WITH WAVEGUIDES OR CAVITY RESONATORS IN YOUR PRESENT JOB	59	51	70	80
P 985	P2-02 DO YOU INSPECT WAVEGUIDES OR CAVITY RESONATORS	56	48	68	60
P 986	P2-03 DO YOU CLEAN WAVEGUIDES OR CAVITY RESONATORS	44	41	48	60
P 987	P2-04 DO YOU BEND WAVEGUIDES OR CAVITY RESONATORS	12	9	18	20
P 988	P2-05 DO YOU TWIST WAVEGUIDES OR CAVITY RESONATORS	11	9	17	20
P 989	P2-06 DO YOU PRESSURIZE WAVEGUIDES OR CAVITY RESONATORS	36	39	30	40
P 990	P2-07 DO YOU PURGE WAVEGUIDES OR CAVITY RESONATORS	14	14	9	20
P 991	P2-08 DO YOU TROUBLESHOOT WAVEGUIDES OR CAVITY RESONATORS	39	38	44	40
P 992	P2-09 DO YOU REMOVE OR INSTALL COMPLETE WAVEGUIDES	46	42	52	60
P 993	P2-10 DO YOU REMOVE OR INSTALL WAVEGUIDE SECTIONS	54	48	61	60
P 994	P2-11 DO YOU REMOVE OR INSTALL DUMMY LOADS	42	39	44	60
P 995	P2-12 DO YOU REMOVE OR INSTALL E BENDS	23	20	27	0
P 996	P2-13 DO YOU REMOVE OR INSTALL H BENDS	23	20	27	20
P 997	P2-14 DO YOU REMOVE OR INSTALL OTHER BENDS	31	29	29	0
P 998	P2-15 DO YOU REMOVE OR INSTALL CHOKE JOINTS	19	18	17	20
P 999	P2-16 DO YOU REMOVE OR INSTALL ROTATING JOINTS	40	41	40	40
P1000	P2-17 DO YOU REMOVE OR INSTALL DIRECTIONAL COUPLERS	48	43	57	60
P1001	P2-18 DO YOU REMOVE OR INSTALL BIDIRECTIONAL COUPLERS	20	18	19	20
P1002	P2-19 DO YOU USE OR REFER TO "A" WALL OF WAVEGUIDES	7	6	9	0

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK		SPL 001	SPL 004	SPL 005	SPL 006
P1003	P2-20 DO YOU USE OR REFER TO "B" WALL OF WAVEGUIDES	7	6	8	0
P1004	P2-21 DO YOU USE OR REFER TO CUTOFF FREQUENCY OF WAVEGUIDES	8	5	12	0
P1005	P2-22 DO YOU USE OR REFER TO FREQUENCY-DETERMINING WALL OF WAVEGUIDES	7	5	7	0
P1006	P2-23 DO YOU USE OR REFER TO POWER-DETERMINING WALL OF WAVEGUIDES	6	5	7	0
P1007	P2-24 DO YOU USE OR REFER TO ELECTRIC FIELD BOUNDARY CONDITIONS	4	4	3	0
P1008	P2-25 DO YOU USE OR REFER TO MAGNETIC FIELD BOUNDARY CONDITIONS	5	4	4	0
P1009	P2-26 DO YOU USE OR REFER TO DUPLEXER FIELD BOUNDARY CONDITIONS	5	4	4	0
P1010	P2-27 DO YOU USE OR REFER TO THE GENERAL RULE THAT MOST WAVEGUIDES ARE MADE WITH A "B" WALL SIZE OF .7 WAVELENGTHS	4	3	4	0
P1011	P2-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT MOST "A" WALLS RANGE FROM .2 TO .5 WAVELENGTHS IN SIZE, WITH .35	3	2	3	0
P1012	P2-29 ARE YOU CONCERNED WITH THE MATERIAL (SUCH AS BRASS) WHICH WAVEGUIDES ARE MADE OF	9	6	10	20
P1013	P2-30 DO YOU COMPUTE THE LENGTH OF A WAVEGUIDE FOR SPECIFIC INSTALLATION	3	2	3	0
P1014	P2-31 DO YOU USE THE RIGHT HAND RULE TO DETERMINE THE DIRECTION OF PROPAGATION, DIRECTION OF "E" FIELD, OR	4	2	5	0
P1015	P2-32 DO YOU USE OR REFER TO THE TIME PHASE OF PEAK "E" OR "H" LINES IN WAVEGUIDES	3	2	2	0
P1016	P2-33 DO YOU MEASURE THE TIME PHASE OF "E" OR "H" LINES IN WAVEGUIDES	2	2	1	0
P1017	P2-34 DO YOU USE OR REFER TO THE SPACE QUADRATURE OF "E" OR "H" LINES IN WAVEGUIDES	3	2	2	0
P1018	P2-35 ARE HIGH POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	15	14	14	20
P1019	P2-36 ARE LOW POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	13	12	11	20
P1020	P2-37 ARE LOOPS USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	16	17	14	20
P1021	P2-38 ARE APERTURES (WINDOWS OR IRISES) USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	25	24	25	20
P1022	P2-39 ARE DON'T REMEMBER THE KIND OF ENERGY COUPLING USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	17	15	22	20
P1023	P2-40 DO YOU DETERMINE WHERE PROBES SHOULD BE MOUNTED IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO	2	2	1	0
P1024	P2-41 DO YOU DETERMINE THE POSITIONING OF LOOPS IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO	2	2	1	0

WAVEGUIDES AND CAVITY RESONATORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
P1025	P2-42 DO YOU DETERMINE THE POSITIONING OR SIZE OF APERTURES IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO	2	1	2	0	
P1026	P2-43 ARE CHOKE JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	14	12	14	20	
P1027	P2-44 ARE ROTATING JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	43	40	49	40	
P1028	P2-45 ARE DON'T REMEMBER THE KIND OF JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	15	13	15	20	
P1029	P2-46 DO YOU TUNE CAVITY RESONATORS USING CAPACITIVE TUNING	20	19	19	40	
P1030	P2-47 DO YOU TUNE CAVITY RESONATORS USING INDUCTIVE TUNING	11	13	8	40	
P1031	P2-48 DO YOU TUNE CAVITY RESONATORS USING VOLUME TUNING	16	14	16	20	
P1032	P2-49 DO YOU TUNE CAVITY RESONATORS USING DON'T REMEMBER THE METHOD OF TUNING	18	16	20	20	
P1033	P2-50 DO YOU MEASURE THE FREQUENCY OF SIGNALS IN CAVITY RESONATORS	30	28	31	40	
P1034	P3-01 IN YO R PRESENT JOB DO YOU WORK WITH KLYSTRONS, TRAVELING WAVE TUBES (TWT), PARAMETRIC AMPLIFIERS, OR	53	45	61	80	
P1035	P3-02 DO YOU USE OR REFER TO INTERELECTRODE CAPACITANCE	9	8	9	20	
P1036	P3-03 DO YOU USE OR REFER TO ELECTRON TRANSIT TIME	7	5	7	20	
P1037	P3-04 DO YOU USE OR REFER TO LEAD INDUCTANCE	5	4	7	20	
P1038	P3-05 DO YOU USE OR REFER TO RF LOSSES IN EXTERNAL CIRCUITRY	16	12	20	40	
P1039	P3-06 DO YOU USE OR REFER TO PRINCIPLE OF ELECTRON VELOCITY MODULATION	8	4	10	40	
P1040	P3-07 DO YOU USE OR REFER TO ELECTRON BUNCHING	10	6	9	40	
P1041	P3-08 DO YOU WORK WITH TWO-CAVITY KLYSTRONS	8	5	11	20	
P1042	P3-09 DO YOU WORK WITH THREE-CAVITY KLYSTRONS	2	3	1	0	
P1043	P3-10 DO YOU WORK WITH REFLEX KLYSTRONS	29	27	33	60	
P1044	P3-11 DO YOU WORK WITH TRAVELING-WAVE TUBES (TWT)	21	14	25	20	
P1045	P3-12 DO YOU WORK WITH NONDEGENERATIVE PARAMETRIC AMPLIFIERS	13	13	5	60	
P1046	P3-13 DO YOU WORK WITH UP-CONVERTER PARAMETRIC AMPLIFIERS	8	9	3	0	
P1047	P3-14 DO YOU WORK WITH MAGNETRONS	51	46	66	80	MICROWAVE AMPLIFIERS AND OSCILLATORS
P1048	P3-15 DO YOU INSPECT KLYSTRONS OR TWT	34	25	47	60	
P1049	P3-16 DO YOU CLEAN KLYSTRONS OR TWT	26	19	34	60	
P1050	P3-17 DO YOU TUNE KLYSTRONS OR TWT ELECTRICALLY	23	18	29	60	
P1051	P3-18 DO YOU TUNE KLYSTRONS OR TWT MECHANICALLY	27	20	39	60	
P1052	P3-19 DO YOU PERFORM OPERATIONAL CHECKS OF KLYSTRONS OR TWT	34	25	44	60	
P1053	P3-20 DO YOU TROUBLESHOOT KLYSTRONS OR TWT	30	22	45	40	
P1054	P3-21 DO YOU REMOVE OR REPLACE COMPLETE KLYSTRON OR TWT	37	28	52	60	
P1055	P3-22 DO YOU REMOVE OR REPLACE KLYSTRON OR T+T COMPONENTS	14	12	18	20	
P1056	P3-23 DO YOU INSPECT PARAMETRIC AMPLIFIERS	22	21	11	60	
P1057	P3-24 DO YOU CLEAN PARAMETRIC AMPLIFIERS	19	19	10	80	
P1058	P3-25 DO YOU ADJUST PARAMETRIC AMPLIFIERS	20	21	10	60	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006
P1059	P3-26 DO YOU TUNE PARAMETRIC AMPLIFIERS	19	22	9	60
P1060	P3-27 DO YOU PERFORM OPERATIONAL CHECKS OF PARAMETRIC AMPLIFIERS	22	22	9	60
P1061	P3-28 DO YOU TROUBLESHOOT PARAMETRIC AMPLIFIERS	19	18	9	60
P1062	P3-29 DO YOU REMOVE OR REPLACE COMPLETE PARAMETRIC AMPLIFIER	20	20	12	60
P1063	P3-30 DO YOU REMOVE OR REPLACE PARAMETRIC AMPLIFIER COMPONENTS	16	16	9	60
P1064	P3-31 DO YOU INSPECT MAGNETRONS	47	43	62	60
P1065	P3-32 DO YOU CLEAN MAGNETRONS	40	36	52	80
P1066	P3-33 DO YOU ADJUST MAGNETRONS	44	39	58	60
P1067	P3-34 DO YOU TUNE MAGNETRONS	47	43	59	80
P1068	P3-35 DO YOU PERFORM OPERATIONAL CHECKS OF MAGNETRONS	49	44	64	60
P1069	P3-36 DO YOU TROUBLESHOOT MAGNETRONS	43	40	56	40
P1070	P3-37 DO YOU REMOVE OR REPLACE COMPLETE MAGNETRON	49	45	66	60
P1071	P3-38 DO YOU REMOVE OR REPLACE MAGNETRON COMPONENTS	16	13	23	0
P1072	P3-39 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS COLLECTOR PLATES	5	4	6	20
P1073	P3-40 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER CAVITIES	4	3	4	20
P1074	P3-41 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER GRIDS	4	3	5	20
P1075	P3-42 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS FEEDBACK LOOPS	4	4	2	0
P1076	P3-43 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS DRIFT SPACES	2	2	1	0
P1077	P3-44 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS BUNCHER GRIDS	3	2	2	0
P1078	P3-45 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS BUNCHER CAVITIES	3	2	2	0
P1079	P3-46 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CONTROL GRIDS	5	4	4	0
P1080	P3-47 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATHODES	6	5	6	0
P1081	P3-48 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON REPELLER (REFLECTOR) PLATES	17	16	17	40
P1082	P3-49 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRIDS	13	12	13	40
P1083	P3-50 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRID CAVITY GAPS	9	7	11	40
P1084	P3-51 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON RESONANT CAVITIES	15	14	16	40
P1085	P3-52 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON MAGNETIC COUPLING LOOPS	9	9	7	40
P1086	P3-53 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON FILAMENTS	15	14	16	60
P1087	P3-54 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON CATHODES	14	13	14	40

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

BY-TSK	SPL 001	SPL 004	SPL 005	SPL 00*
P1088 P3-55 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON OUTPUT LEADS	15	14	19	40
P1089 P3-56 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES FILAMENTS	11	7	14	0
P1090 P3-57 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES CATHODES	10	6	12	0
P1091 P3-58 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES MODULATOR GRIDS	8	5	9	0
P1092 P3-59 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES ANODES	9	6	11	0
P1093 P3-60 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES HELIXES	8	5	9	0
P1094 P3-61 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES COLLECTORS	8	5	11	0
P1095 P3-62 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES MAGNETS	8	4	9	0
P1096 P3-63 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES ATTENUATORS	10	5	12	20
P1097 P3-64 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE CIRCULATORS	6	5	3	20
P1098 P3-65 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER SIGNAL CAVITIES	8	8	2	40
P1099 P3-66 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER IDLER CAVITIES	10	11	3	60
P1100 P3-67 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER VARACTOR DIODES	13	14	5	60
P1101 P3-68 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE ISOLATORS	5	4	2	20
P1102 P3-69 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER REVERSE-BIAS BATTERIES	3	2	2	0
P1103 P3-70 DO YOU PERFORM TASKS ON ANODES	9	8	9	20
P1104 P3-71 DO YOU PERFORM TASKS ON ANODE COOLING PINS	6	5	5	20
P1105 P3-72 DO YOU PERFORM TASKS ON COUPLING LOOPS	6	6	5	0
P1106 P3-73 DO YOU PERFORM TASKS ON HEATER LEADS	13	12	17	0
P1107 P3-74 DO YOU PERFORM TASKS ON RESONANT CAVITIES	12	12	14	0
P1108 P3-75 DO YOU PERFORM TASKS ON CATHODES	12	10	15	0
P1109 P3-76 DO YOU PERFORM TASKS ON MAGNETS	18	16	22	0
Q1110 Q1-01 DO YOU USE OR REFER TO STORAGE REGISTERS	16	10	22	20
Q1111 Q1-02 DO YOU USE OR REFER TO SHIFT REGISTERS	19	11	22	20
Q1112 Q1-03 DO YOU USE OR REFER TO LOGIC SYMBOLS OF SHIFT REGISTERS	18	11	21	20
Q1113 Q1-04 DO YOU USE OR REFER TO LOGIC SYMBOLS OF STORAGE REGISTERS	17	11	19	20
Q1114 Q1-05 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	16	9	19	20
Q1115 Q1-0* DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF REGISTERS	14	8	17	0

REGISTERS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
Q1116	Q1-07 DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP OF A SHIFT REGISTER AFTER A SPECIFIED NUMBER OF SHIFT PULSES	15	9	17	20	
Q1117	Q2-01 DO YOU WORK WITH DIGITAL COUNTERS, REGISTERS, OR STORAGE DEVICES IN YOUR PRESENT JOB	16	11	22	0	
Q1118	Q2-02 DO YOU USE OR REFER TO DELAY LINES	13	7	19	0	
Q1119	Q2-03 DO YOU USE OR REFER TO MAGNETIC CORES	5	3	9	0	
Q1120	Q2-04 DO YOU USE OR REFER TO MAGNETIC DRUMS	2	1	3	0	
Q1121	Q2-05 DO YOU USE OR REFER TO MAGNETIC TAPES	5	3	6	0	STORAGE DEVICES
Q1122	Q2-06 DO YOU USE OR REFER TO ACCESS TIME OR SPEED OR MEMORY SYSTEMS	6	3	9	0	
Q1123	Q2-07 DO YOU USE OR REFER TO WORD CAPACITY OF MEMORY SYSTEMS	6	2	12	0	
Q1124	Q2-08 DO YOU USE OR REFER TO VOLATILITY OF MEMORY SYSTEMS	3	2	4	0	
Q1125	Q2-09 DO YOU USE OR REFER TO LOGIC SYMBOL OF DELAY LINES	9	4	15	0	
Q1126	Q3-01 IN YOUR PRESENT JOB, DO YOU WORK WITH DIGITAL-TO-ANALOG (D/A) CONVERTERS, ANALOG-TO-DIGITAL (A/D)	22	18	17	40	
Q1127	Q3-02 DO YOU COMPUTE OUTPUT VOLTAGES FOR ELECTROMECHANICAL DIGITAL-TO-ANALOG (D/A) CONVERTERS FOR GIVEN INPUT	6	6	4	0	
Q1128	Q3-03 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE COUNT IN ELECTROMECHANICAL DIGITAL-TO-ANALOG (D/A)	3	3	2	0	
Q1129	Q3-04 DO YOU COMPUTE ANALOG VOLTAGES FOR GIVEN BINARY COUNTS IN ELECTRONIC DIGITAL-TO-ANALOG (D/A) CONVERTERS	6	4	6	0	
Q1130	Q3-05 DO YOU PERFORM SAMPLE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	6	4	7	20	
Q1131	Q3-06 DO YOU PERFORM HOLD FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	6	4	7	20	DIGITAL TO ANALOG CONVERTERS
Q1132	Q3-07 DO YOU PERFORM COMPARE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	6	4	7	20	
Q1133	Q3-08 DO YOU PERFORM DIGITIZE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	6	3	7	20	
Q1134	Q3-09 DO YOU PERFORM DON'T REMEMBER WHICH FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER	5	4	4	20	
Q1135	Q3-10 DO YOU USE OR REFER TO SAMPLE FUNCTION OF A/D CONVERTERS	9	5	11	20	
Q1136	Q3-11 DO YOU USE OR REFER TO HOLD FUNCTION OF A/D CONVERTERS	8	5	10	20	
Q1137	Q3-12 DO YOU USE OR REFER TO COMPARE FUNCTION OF A/D CONVERTERS	8	5	10	20	
Q1138	Q3-13 DO YOU USE OR REFER TO DIGITAL FUNCTION OF A/D CONVERTERS	9	5	11	20	
Q1139	Q3-14 DO YOU PERFORM ANY TASKS ON MECHANICAL ANALOG-TO-DIGITAL (A/D) CONVERTERS	8	8	5	20	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
R1140	R1-01 DO YOU WORK WITH PHANTASTRON CIRCUITRY IN YOUR PRESENT JOB	29	31	27	80	PHANTASTRONS
R1141	R2-01 IN YOUR PRESENT JOB DO YOU WORK WITH SCHMITT TRIGGER CIRCUITS	26	22	30	20	
R1142	R2-02 DO YOU TRACE DATA FLOW THROUGH SCHMITT TRIGGER SCHEMATIC DIAGRAMS	20	17	25	40	SCHMITT TRIGGERS
R1143	R2-03 DO YOU USE OR REFER TO SCHMITT TRIGGER LOGIC SYMBOLS	18	14	22	40	
R1144	R3-01 IN YOUR PRESENT JOB DO YOU FABRICATE MULTICONDUCTOR CABLES	37	30	50	40	
R1145	R3-02 DO YOU FABRICATE COAXIAL CABLES	47	40	56	80	CABLE FABRICATION
S1146	S1-01 IN YOUR PRESENT JOB DO YOU PERFORM ANY TASKS ON VISUAL READOUT SYSTEMS	31	29	27	60	
S1147	S1-02 DO YOU PERFORM ANY TASKS ON NIXIE LIGHTS OR NIXIE LIGHT DECODER SYSTEMS	25	26	14	60	
S1148	S1-03 DO YOU ANALYZE NIXIE LIGHT DECODER SYSTEMS USING BOOLEAN ALGEBRA	6	6	6	0	INPUT/OUTPUT DEVICES
S1149	S2-01 DO YOU WORK WITH PHOTO TUBES IN YOUR PRESENT JOB	9	11	4	20	PHOTO SENSITIVE DEVICES
S1150	S3-01 IN YOUR PRESENT JOB DO YOU WORK WITH CHOPPER CIRCUITS	21	25	12	0	
S1151	S3-02 DO YOU MEASURE EXCITATION FREQUENCIES	8	8	8	0	
S1152	S3-03 DO YOU MEASURE VOLTAGE-CURRENT PHASE RELATIONSHIPS	7	6	6	0	
S1153	S3-04 DO YOU USE OR REFER TO EXCITATION FREQUENCIES	8	8	8	0	
S1154	S3-05 DO YOU USE OR REFER TO VOLTAGE-CURRENT PHASE RELATIONSHIPS	7	7	6	0	
S1155	S3-06 DO YOU USE SERVOS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	16	18	12	20	SYNCHRONOUS VIBRATIONS (CHOPPER CIRCUITS)
S1156	S3-07 DO YOU USE DETECTORS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	16	19	11	20	
S1157	S3-08 DO YOU USE ERROR SIGNAL DEVICES IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	18	21	12	20	
S1158	S3-09 DO YOU USE COMPARISON CIRCUITS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	16	19	11	20	
T1159	T1-01 DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH INFRARED SYSTEMS	1	1	1	0	
T1160	T1-02 DO YOU INSPECT INFRARED SYSTEMS	0	0	1	0	
T1161	T1-03 DO YOU CLEAN INFRARED SYSTEMS	0	0	0	0	
T1162	T1-04 DO YOU ADJUST OR CALIBRATE INFRARED SYSTEMS	0	0	1	0	
T1163	T1-05 DO YOU OPERATE INFRARED SYSTEMS	0	0	0	0	
T1164	T1-06 DO YOU TROUBLESHOOT WIRE CONNECTIONS OF INFRARED SYSTEMS	0	0	1	0	
T1165	T1-07 DO YOU TROUBLESHOOT MAJOR ASSEMBLIES OF INFRARED SYSTEMS	0	0	0	0	INFRARED
T1166	T1-08 DO YOU TROUBLESHOOT DOWN TO INFRARED SYSTEM COMPONENT PARTS	0	0	1	0	
T1167	T1-09 DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF INFRARED SYSTEMS	0	0	0	0	
T1168	T1-10 DO YOU REMOVE OR REPLACE INFRARED SYSTEM COMPONENT PARTS	0	0	0	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
T1169	T1-11 DO YOU USE OR REFER TO FAR REGION	0	0	1	0	
T1170	T1-12 DO YOU USE OR REFER TO INTERMEDIATE REGION	0	0	1	0	
T1171	T1-13 DO YOU USE OR REFER TO NEAR REGION	0	0	1	0	
T1172	T1-14 DO YOU USE OR REFER TO MICRON	0	0	1	0	
T1173	T1-15 DO YOU USE OR REFER TO GRAY BODIES	0	0	0	0	
T1174	T1-16 DO YOU USE OR REFER TO BLACK BODIES	0	0	1	0	
T1175	T1-17 DO YOU USE OR REFER TO ABSORPTION	0	0	1	0	
T1176	T1-18 DO YOU USE OR REFER TO SCATTERING	0	0	1	0	
T1177	T1-19 DO YOU USE OR REFER TO ABSOLUTE ZERO	0	0	1	0	
T1178	T1-20 DO YOU PERFORM TASKS ON BLITZ	0	0	0	0	
T1179	T1-21 DO YOU PERFORM TASKS ON TARGET BUTTONS	0	0	1	0	
T1180	T1-22 DO YOU PERFORM TASKS ON ERECTOR LENSES	0	0	1	0	
T1181	T1-23 DO YOU PERFORM TASKS ON OCULAR LENSES	0	0	1	0	
T1182	T1-24 DO YOU PERFORM TASKS ON CORRECTION LENSES	0	0	1	0	
T1183	T1-25 DO YOU PERFORM TASKS ON FILTERS	0	0	1	0	
T1184	T1-26 DO YOU PERFORM TASKS ON SPHERICAL MIRRORS	0	0	1	0	
T1185	T1-27 DO YOU PERFORM TASKS ON PLANE MIRRORS	0	0	1	0	
T1186	T2-01 DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH LASERS	0	0	0	0	
T1187	T2-02 DO YOU INSPECT LASER SYSTEMS	0	0	1	0	
T1188	T2-03 DO YOU CLEAN LASER SYSTEMS	0	0	1	0	
T1189	T2-04 DO YOU OPERATE LASER SYSTEMS	0	0	1	0	
T1190	T2-05 DO YOU OPERATE LASER SYSTEMS	0	0	1	0	
T1191	T2-06 DO YOU TROUBLESHOOT WIRE CONNECTIONS OF LASER SYSTEMS	0	0	1	0	
T1192	T2-07 DO YOU TROUBLESHOOT MAJOR ASSEMBLIES OF LASER SYSTEMS	0	0	1	0	
T1193	T2-08 DO YOU TROUBLESHOOT TO COMPONENT PARTS OF LASER SYSTEMS	0	0	1	0	
T1194	T2-09 DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF LASER SYSTEMS	0	0	1	0	
T1195	T2-10 DO YOU REMOVE OR REPLACE COMPONENT PARTS OF LASER SYSTEMS	0	0	1	0	LASERS
T1196	T2-11 DO YOU USE OR REFER TO ANGSTROMS (A)	0	0	0	0	
T1197	T2-12 DO YOU USE OR REFER TO ELECTRON ENERGY LEVELS	0	0	1	0	
T1198	T2-13 DO YOU USE OR REFER TO GROUND STATE	0	0	1	0	
T1199	T2-14 DO YOU USE OR REFER TO EXCITED STATE	0	0	0	0	
T1200	T2-15 DO YOU USE OR REFER TO PACKET OF RADIATION	0	0	0	0	
T1201	T2-16 DO YOU USE OR REFER TO PHOTONS	0	0	0	0	
T1202	T2-17 DO YOU USE OR REFER TO SPONTANEOUS EMISSION	0	0	0	0	
T1203	T2-18 DO YOU USE OR REFER TO STIMULATED EMISSION	0	0	0	0	
T1204	T2-19 DO YOU USE OR REFER TO COHERENCE OR INCOHERENCE	0	0	0	0	
T1205	T2-20 DO YOU USE OR REFER TO INVERSION LEVEL	0	0	1	0	
T1206	T2-21 DO YOU USE OR REFER TO MONOCHROMATIC	0	0	1	0	
T1207	T2-22 DO YOU WORK WITH ACTIVE MATERIALS	0	0	1	0	
T1208	T2-23 DO YOU WORK WITH PUMPING SOURCES	0	0	1	0	
T1209	T2-24 DO YOU WORK WITH FULL SILVERED (100% REFLECTIVE) MIRRORS	0	0	1	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
T1210	T2-25 DO YOU WORK WITH HALF SILVERED (92% REFLECTIVE) MIRRORS	0	0	1	0	
T1211	T2-26 DO YOU WORK WITH HELICAL FLASHTUBES	0	0	1	0	
T1212	T2-27 DO YOU WORK WITH RUBY	0	0	1	0	
T1213	T2-28 DO YOU WORK WITH HELIUM-NEON	0	0	1	0	
T1214	T2-29 DO YOU WORK WITH HELIUM-XENON	0	0	1	0	
T1215	T2-30 DO YOU WORK WITH XENON	0	0	1	0	
T1216	T2-31 DO YOU WORK WITH CESIUM-HELIUM	0	0	1	0	
T1217	T2-32 DO YOU WORK WITH ARGON	0	0	1	0	
T1218	T2-33 DO YOU WORK WITH NEODYMIUM IN GLASS	0	0	1	0	
T1219	T2-34 DO YOU WORK WITH GALLIUM ARSENIDE	0	0	1	0	
T1220	T3-01 IN YOUR PRESENT JOB DO YOU WORK WITH DISPLAY TUBES, SUCH AS DIRECT VIEW STORAGE (DVST) OR MULTIPLE MODE	1	1	1	0	
T1221	T3-02 DO YOU INSPECT DVST OR MMST	1	0	1	0	
T1222	T3-03 DO YOU CLEAN DVST OR MMST	1	0	1	0	
T1223	T3-04 DO YOU ADJUST OR CALIBRATE DVST OR MMST	1	1	1	0	
T1224	T3-05 DO YOU OPERATE SYSTEMS THAT CONTAIN DVST OR MMST	1	1	1	0	
T1225	T3-06 DO YOU TROUBLESHOOT DVST OR MMST CIRCUITS	1	1	1	0	
T1226	T3-07 DO YOU REMOVE OR REPLACE DVST OR MMST TUBES FROM MAJOR ASSEMBLIES OR UNITS	1	1	1	0	DISPLAY TUBES
T1227	T3-08 DO YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF DVST	1	1	1	0	
T1228	T3-09 DO YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF MMST	0	1	0	0	
T1229	T3-10 DO YOU PERFORM TASKS ON FLOOD GUNS	0	0	0	0	
T1230	T3-11 DO YOU PERFORM TASKS ON WRITE GUNS	0	0	1	0	
T1231	T3-12 DO YOU PERFORM TASKS ON ATTACK GUNS	0	0	0	0	
T1232	T3-13 DO YOU PERFORM TASKS ON ERASE GUNS	0	0	0	0	
T1233	T3-14 DO YOU PERFORM TASKS ON STORAGE GRIDS	0	0	0	0	
01234	01-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY PROGRAMMING TASKS	7	5	12	0	
01235	01-02 DO YOU USE OR REFER TO DECIMAL SYSTEMS	5	3	11	0	
01236	01-03 DO YOU USE OR REFER TO PROGRAMS	6	4	13	0	
01237	01-04 DO YOU USE OR REFER TO HEXIDECIMAL SYSTEMS	1	1	3	0	
01238	01-05 DO YOU USE OR REFER TO 8-4-2-1 SYSTEMS	4	2	8	0	
01239	01-06 DO YOU USE OR REFER TO FOUR SYSTEMS	0	0	1	0	
01240	01-07 DO YOU USE OR REFER TO BINARY SYSTEMS	5	3	11	0	
01241	01-08 DO YOU USE OR REFER TO TIME-SHARING	3	1	8	0	PROGRAMMING
01242	01-09 DO YOU USE OR REFER TO DATA WORDS	5	2	10	0	
01243	01-10 DO YOU USE OR REFER TO ADDRESS WORDS	5	3	11	0	
01244	01-11 DO YOU USE OR REFER TO ADDRESS/SUBADDRESS	4	2	7	0	
01245	01-12 DO YOU USE OR REFER TO STEERING/INFORMATION	3	1	6	0	
01246	01-13 DO YOU USE OR REFER TO INFORMATION WORDS	4	2	8	0	
01247	01-14 DO YOU PERFORM TASKS ON SINGLE LEVEL PROGRAMMING	3	2	9	0	
01248	01-15 DO YOU PERFORM TASKS ON MULTI-LEVEL PROGRAMMING	2	1	4	0	

PCT MBRS RESPONDING 'YES' BY SELECTED GRPS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPL 001	SPL 004	SPL 005	SPL 006	
U1249	U1-16 DO YOU PERFORM TASKS ON INPUT DEVICES	5	2	9	0	
U1250	U1-17 DO YOU PERFORM TASKS ON STORAGE DEVICES	4	2	7	0	
U1251	U1-18 DO YOU PERFORM TASKS ON ARITHMETIC SECTIONS	3	1	4	0	
U1252	U1-19 DO YOU PERFORM TASKS ON CONTROL SECTIONS	4	2	9	0	
U1253	U1-20 DO YOU PERFORM TASKS ON OUTPUT DEVICES	5	3	11	0	
U1254	U1-21 DO YOU PERFORM TASKS ON POWER SUPPLIES	5	1	9	0	
U1255	U2-01 DO YOU USE DECIBELS TO EXPRESS AMPLIFICATION AND ATTENUATION	57	52	61	60	DB AND POWER RATIOS
U1256	U2-02 DO YOU USE LOGARITHMS TO COMPUTE OUTPUT POWER IN DECIBELS	15	14	14	20	
U1257	U2-03 DO YOU USE LOGARITHMS TO COMPUTE ATTENUATION IN DECIBELS	16	14	14	20	
U1258	U2-04 DUMMY TASK TO IDENTIFY INCUMBENTS WHO PERFORMED NO TASKS	7	10	3	0	

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AUTOMATIC TRACKING RADAR REPAIR CAREER LADDER AFSC 303X3.(U)
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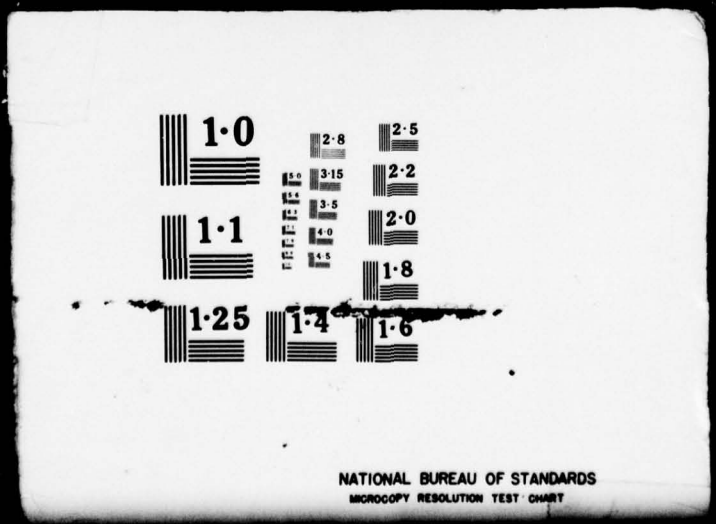

SUPPLEMENTARY

INFORMATION

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Basic electronics	Air Force training
Avionics	Teaching methods
Electronic equipment	Training
Electronic technicians	

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report summarizes the results of the administration of the Electronic Principles Inventory to airmen assigned to Automatic Tracking Radar Repair Specialty (AFSC 303X3). The report gives a detailed listing of the technical tasks and knowledge needed to perform the jobs within the specialty or career ladder.

Over CONTINUED

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This specialty has the following functions:

Installs, operates and maintains automatic tracking radar systems, satellite tracking systems, microwave command guidance systems, acquisition systems, related electronic warfare equipment, associated identification equipment and uses related electronic test equipment.

Maintains operation logs and maintenance and inspection records. Supervises automatic tracking radar repair personnel.